OWNER'S OPERATING MANUAL

SSG Series™ Rackmount Industrial-Grade UPS Plus®

Uninterruptible Power Supply Models:

SSG1.5KRM-1 - 1.5kVA, 1050W, 120Vac, -20ºC - 55ºC (-4ºF to 131ºF) Operation
SSG1.5KRM-2 - 1.5kVA, 1050W, 230Vac, -20ºC - 55ºC (-4ºF to 131ºF) Operation
SSG2.2KRM-1 2.2kVA, 1540W, 120Vac, -20ºC - 55ºC (-4ºF to 131ºF) Operation
SSG2.2KRM-HW 2.2kVA, 1540W, 120Vac, -20ºC - 40ºC (-4ºF to 104ºF) Operation
SSG2.2KRM-2 - 2.2kVA, 1540W, 230Vac, -20ºC - 55ºC (-4ºF to 131ºF) Operation
SSG3KRM-1 3kVA, 2100W, 120Vac, -20ºC - 55ºC (-4ºF to 131ºF) Operation
SSG3KRM-HW 3kVA, 2100W, 120Vac, -20ºC - 40ºC (-4ºF to 104ºF) Operation
SSG3KRM-2 - 3kVA, 2100W, 230Vac, -20ºC - 55ºC (-4ºF to 131ºF) Operation

SSG Rackmount Models

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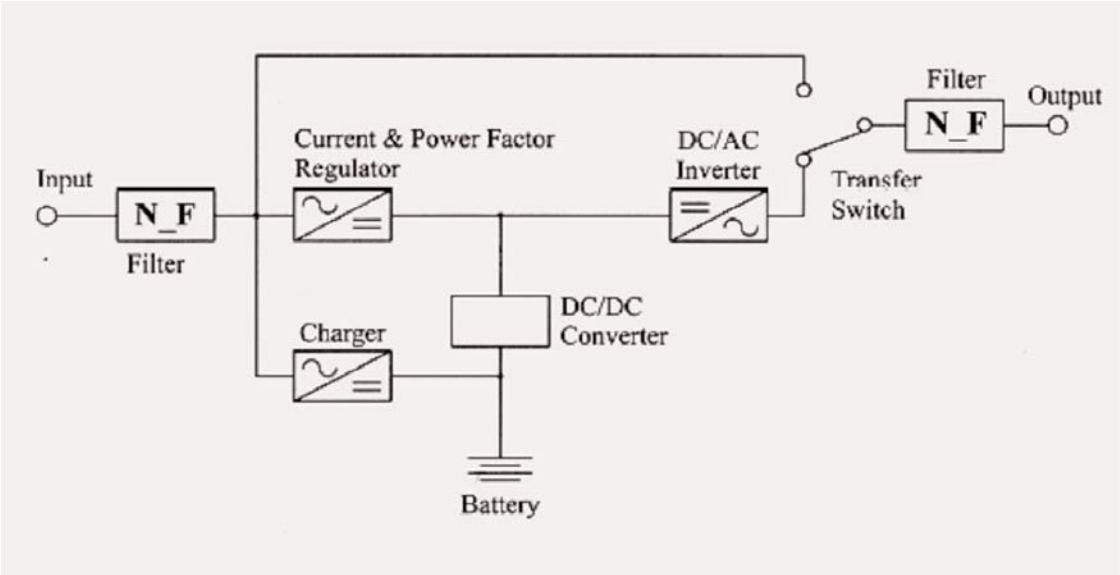
SSG Series™ Industrial-Grade UPS Features

- True Double Conversion On-Line Sinewave Design
- High Temperature 55° C Operation
- LCD Display with Advanced Monitoring
- Output Load Segment Control
- Remote Emergency Power Off (REPO)
- Input Power Factor Correction
- Wide Input Voltage Window
- Precision Output Voltage Regulation
- Superior Brownout, Surge and Transient Protection
- Optional Frequency Converter Operation
- User Replaceable and Hot Swappable Battery Pack
- Optional Extended Battery Banks & Chargers
- RS-232C, USB & Optional SNMP/HTTP Communications
- UPSILON UPS Monitoring & Management Software
- RoHS Compliant
- Two-Year Warranty

SSG Series Double-Conversion On-line UPS Block Diagram



IMPORTANT SAFETY INSTRUCTIONS, SAVE THESE INSTRUCTIONS

RETAIN THIS USER MANUAL!

This manual contains important instructions which must be followed during the installation, operation and maintenance of the SSG Series UPS, battery banks, options and batteries. **Please read all instructions before operating this equipment and save this manual for future reference.**

All of the models presented herein are designed for installation and use in a temperature controlled environment, free of contamination.

This UPS operates from utility power and contains a number of high current back-up batteries; this information is important to all personnel involved. Please read this manual first before continuing to unpack, install or operate this UPS.

STORAGE AND TRANSPORTATION

This UPS must be handled with care and given special attention due to the high amount of energy stored within its internal sealed, lead acid batteries. Please retain the UPS shipping container in the event the UPS needs to be returned for service. It has been designed to ship the UPS safely, without shipping damage.

INSTALLATION

This UPS must be installed in a clean environment, free from moisture, flammable gases or fumes and corrosive substances. Operate the UPS in an indoor environment with an ambient temperature range specified by model number herein.

This UPS is designed for use with industrial, scientific or data processing class equipment. **DO NOT USE TO POWER LIFE SUPPORT EQUIPMENT, OR OTHER DESIGNATED "LIFE CRITICAL" APPLICATIONS.**

The maximum UPS output load (in watts) must never exceed that shown on the UPS rating label. NEVER CONNECT equipment that could overload the UPS or demand half-wave rectification from the UPS, for example: electric drills, vacuum cleaners or hair dryers.

Storing magnetic media on top of the UPS may result in data loss or corruption.

WARNING

This UPS should be installed according to the instructions in this manual. Failure to do so could result in unsafe operation and could invalidate your warranty.

WARNING

Once batteries have reached the end of their life, ensure they are disposed of properly. **PLEASE REFER TO YOUR LOCAL LAWS AND REGULATIONS FOR BATTERY RECYCLING REQUIREMENTS. NEVER DISPOSE OF BATTERIES IN A LAND FILL.**

Do not dispose of battery pack or batteries in a fire. The battery may explode. Do not open or mutilate the battery pack. Released electrolyte is harmful to skin and eyes. It may be toxic.

CAUTION

A battery can present a risk of electrical shock and high short circuit current. The following precautions should be observed when working on batteries:

* Remove watches, rings, and other metal objects.
* Use tools with insulated handles.

1.0 INTRODUCTION

Manual Overview

This user manual has been written to provide basic information about the Falcon SSG Series Industrial Grade UPS Plus. SSG models are available in nominal power ratings of 1500, 2200 and 3000 VA . The SSG Series is a compact, rugged, double conversion, "on-line" UPS. It provides continuous power conditioning and accepts a wide range input voltage while providing tight output voltage regulation with a true sinewave output. The SSG Series UPS protects your sensitive electronics equipment against the widest range of power problems, including power failures, power sags, power surges, brownouts, line noise, high voltage spikes, frequency variations, switching transients, and harmonic distortion.

This manual also describes unpacking, unit installation, the major features of the SSG Series UPS, as well as detailed operation, configuration and troubleshooting.

The specifications section states all of the detailed parameters of operation for the SSG Series, and provides general information on approvals and certifications.

Brief SSG Overview

The Falcon SSG Series Industrial-Grade UPS may be positioned vertical for desktop or floor standing applications. Brackets are supplied to accommodate installation into a standard 19 inch equipment rack.

The SSG Series front panel features a graphical LCD display, providing detailed operational information at a glance. The display enables the user or field service engineer to easily monitor and troubleshoot localized power problems, in addition to UPS operation. UPS control and programming is easily accomplished using the Standby, Function/Test and Set/Alarm Silence buttons. Two levels of audible alarms are also provided when the unit is operating on battery.

The SSG Series rear panel supports the following:

a. Load Segment Control - Multiple output receptacles are grouped into one continuous and two programmable load segments. The two programmable load segments may be set to “shed” or turn off the load segment at loss of utility voltage or when the low battery level has been reached. This allows non-essential loads to be turned off, extending the amount of battery runtime.

b. **Remote Emergency Power Off (REPO)** - SSG models are equipped with a REPO connector that may be interfaced with a computer room’s isolated, normally closed REPO and meets NFPA 70, NEC645-11.

c. RS-232 and USB Ports - These ports may be used to provide communications between the UPS and a network server or other computer systems. When used in conjunction with the supplied UPSILON software, they give the ability to remotely monitor and control the UPS. The software will automatically save all open computer files and initiate an unattended shutdown in the event of a loss of utility. It supports most MS Windows and Linux operating systems. An optional Unix version is available through Falcon at an additional cost.

d. Communications Option Board Expansion Slot - The slot supports the installation of an optional SNMP/HTTP Agent board or contact closure interface board. The SNMP/HTTP Agent board is a TCP-IP addressable solution to remote UPS monitoring and management via LAN, WAN or the Internet. The agent board is supplied with client software that will remotely shutdown multiple servers or computers through the Ethernet LAN. A CD containing software clients and a SNMP MIB II compliant MIB is provided that supports most popular operations systems.

2.0 SSG UPS CIRCUIT DESCRIPTIONS

Input Filter

This portion of the circuit provides surge protection, certified to meet IEC 61000-4-5 and IEC 801-5. It also filters out both electro-magnetic interference (EMI) and radio frequency interference (RFI) and prevents excessive levels from being conducted back to the utility source. All SSG Series rackmount models have been tested and comply with FCC Class B requirements.

Input Power Factor Correction

While the UPS is operating from the utility source, this circuit converts utility AC power to regulated DC power for inverter use. It corrects the input current to maintain a sine waveform to minimize the amount of current distortion that will be reflected back to the utility.

DC/DC Converter

The DC/DC converter utilizes energy from batteries and boosts up the DC bus voltage to a level required by the inverter. This allows the inverter to operate continuously at optimum efficiency and voltage. The converter incorporates a patented circuit which reduces the amount of ripple current and EMI interference to the battery, increasing the overall battery life.

DC/AC Inverter

In utility mode operation, the inverter utilizes the regulated DC output to invert DC back into clean, regulated sinewave AC power. When utility power fails, the inverter will receive its energy from the battery through the DC/DC converter. In both modes of operation, the UPS inverter is on-line and continuously generating clean, regulated AC output power to the load. The IGBT, PWM inverter is of a very robust design and produces a pure sinewave output with a +/-2% voltage regulation. Having a very low output impedance, it can supply the high current demands of high inrush and non-linear loads.

Battery Packs

The SSG Series UPS utilizes a flame retardant battery pack comprised of four 12V, 7AH, valve-regulated, sealed lead acid (VRLA) batteries in each pack. All SSG battery packs are interchangeable between SSG 1.5kVA-3kVA models. They are easily replaced through the UPS front panel. See replacement instructions outlined in this manual.

To maintain the optimum battery life, the user should operate the UPS in an ambient temperature of 68ºF to 77ºF (20ºC to 25ºC). Some SSG Series UPS models have batteries that may be rated operational at -20º C - 55º C (-4º F to 131º F), at these temperatures, battery life will be substantially reduced. Optional extended battery modules are available through Falcon and will extend the amount of battery runtime. Please refer to the exact UPS model in the attached specificaitons for the specific battery option part number.

Battery Charger

The battery charger utilizes energy from the utility power to continuously charge the UPS batteries. The charger operates in "constant power" mode. The UPS batteries are being charged whenever the UPS is plugged in, turned on and operating from utility power. The internal UPS battery charger output is rated at 1 amp.

CAUTION: When making battery bank connections to the UPS, alwasy verify the battery bank circuit breaker(s) are in the off position. PRIOR to turning on the first battery bank circuit breaker, ALWAYS DEPRESS AND HOLD THE BATTERY PRECHARGE PUSHBUTTON LOCATED ON THE UPS REAR PANEL WHILE TURNING ON THE FIRST BATTERY BANK CIRCUIT BREAKER TO PREVENT UPS DAMAGE.

Lithium-Ion Batteries

SSG1.5KRM-1-LI and SSG1.5KRM-2-Li models are equipped with optional internal Lithium-Ion-Phospate Batteries. In comparison with VRLA (valve regulated sealed lead-acid) batteries which weigh 6 lbs. each, the Lithium-ion batteries weigh 1.8 lbs each while supplying almost twice the battery runtime as the same model equipped with VRLA batteries.

CAUTION: If not handeled or disposed of properly Lithium-Ion batteries are extremely dangerious. Lithium-Ion-Phosphate batteries must be recycled - never dispose of the batteries in a land-fill or trash.

Caution: Should a model SSG1.5KRM-1-LI or SSG1.5KRM-2-LI UPS require shipment by air transporation the shipping instrucitons on the following page must be followed:

IMPORTANT SHIPPING INSTRUCTIONS

To ship by air you need to:

1) Shipper must declare Hazardous materials/dangerous Goods description and proper shipping name – Lithium batteries, contained in equipment.
2) Identification Number – 3481(international)/3091(USA) note: that 3481 will be recognized in the USA but the CFR still has 3091 since the US has not harmonized with the rest of the world at this time.
3) The 12V7 batteries have been tested to UN Manual of Tests and Criteria, Part III, subsection 38.3.
4) The 12V7 batteries are under 100Wh and are excepted from the regulations.
5) The UPS must be packed in strong outer packaging constructed of suitable material of adequate strength and design in relation to the packaging's capacity and its intended use. SAVE THE ORIGINAL SHIPPING CARTON, INSERTS AND PACKING MATERIALS.
6) Each consignment with packages bearing the lithium battery handling label must be accompanied with a document with an indication that:
   - the package contains lithium ion cells or batteries;
   - the package must be handled with care and that a flammability hazard exists if the package is damaged;
   - special procedures must be followed in the event the package is damaged, to include inspection and repacking if necessary; and
   - a telephone number for additional information.
11) A Shipper's Declaration for Dangerous Goods is not required.
12) The words "Lithium ion batteries", "not restricted" and "PI 967" must be included on the air waybill, when an air waybill is used. The information should be shown in the "Nature and Quantity of Goods" box of the air waybill.

IMPORTANT LITHIUM-ION BATTERY SAFETY INSTRUCTIONS

1) Always replace the external UPS battery fuse with one of the same type and rating.
2) Always replace batteries with A123 12V7 manufacturer and type. Never attempt to replace with VRLA batteries.
3) Never dispose of the UPS or its internal batteries in a land fill. The UPS and batteries must be recycled by a state registered recycler.
4) For emergency information concerning A123 Model 12V7 Lithium-Ion-Phosphate batteries call:
   US & Canada 1-800-232-9300
   International +1-703627-3887
5) Never store a UPS containing Lithium-Ion batteries in temperatures above 65oC.
6) Never attempt to replace the internal battery fuses. Batteries Must Be Replaced if internal Battery Fuse is blown.

7) Never Apply a Short Circuit Across The Batteries as Personnel Injury, Fire or Explosion May Result.

8) **DANGER ---- NEVER ATTEMPT TO CONNECT AN EXTENDED BATTERY BANK CONTAINING VRLA LEAD-ACID BATTERIES TO A UPS CONTAINING INTERNAL LITHIUM-ION-PHOSPHATE BATTERIES.**

Manual Bypass Function

A manual bypass button is located on the SSG front panel. When the UPS is operating from utility in the normal on-line state, depressing this button will cause the UPS to transfer to bypass. Depressing the bypass button again will return the UPS to the normal on-line condition.

Automatic Bypass Transfers

The SSG Series UPS will automatically switch to bypass to energize the connected load when the UPS is first turned on, encounters an overload, encounters an over temperature condition, or upon a UPS failure condition. Should any of these events occur, the UPS will transfer to bypass mode, sound an audible alarm and provide a "bypass" indication on the LCD display.

Output Filter

As with the input filter stage, the output filter maintains conducted (EMC) and RFI levels below FCC Class B limits.

3. 0 INSTALLATION

Unpacking

The SSG Series UPS may be shipped in a number of boxes, depending on the model and configuration ordered. The number of boxes you have received should be as indicated:

MODEL	BATTERY MODULE	NUMBER OF BOXES
SSG1.5KRM-X	n/a (internal battery pack)	1 box shipped
SSG2.2KRM-X	1 battery module	2 boxes shipped
SSG3KRM-X	1 battery module	2 boxes shipped

If you have not received the proper number of boxes, please contact Falcon Electric Customer Service at 1-800-842-6940.

This UPS is shipped complete with all cables required for operation, including UPSILON software, and rackmount ears for 19" rackmount shelf mounting. A full list of the box contents is provided as follows:

SSG1.5KRM-X

Box 1 contains:

UPS module with fitted battery pack
RS-232 cable
Software CD
Manual
19" rack ears (+ screws)

SSG2.2KRM-X / SSG3KRM-X

Box 1 contains:

UPS module without battery
RS-232 cable
Software CD
Manual
19" rack ears (+ screws)

Box 2 contains:
Battery module
Battery connection cable
Keyhole hardware
19" rack ears (+ screws)
1 set of mounting plates & securing hardware

Inspecting The Equipment

Visually inspect the UPS for freight damage. If any equipment has been damaged during shipment, keep the shipping cartons and packing materials for the carrier, and immediately file a claim for “shipping damage” with the carrier. If you discover damage after acceptance, file a claim for “concealed damage”.

To file a claim for shipping damage or concealed damage:

1. YOU MUST file with the carrier within 15 days of receipt of the equipment;
2. YOU MUST send a copy of the damage claim within 15 days to Falcon Electric, Inc.

CAUTION

The UPS and Battery Module are heavy. Take proper precautions when lifting or moving them.

1. Install the UPS indoors in a controlled environment.
2. Place the UPS in an area with unrestricted airflow around the unit, away from water, flammable liquids, gases, corrosives, and conductive contaminant.
3. Maintain a minimum clearance of 4 inches in the front and rear of the UPS.
4. Maintain an ambient temperature range specified in the model specificaiton. To maximize the life time of the batteries, an ambient temperature of 68ºF to 77ºF (20ºC to 25ºC) is recommended. **OPERATION IN TEMPERATURES ABOVE 77ºF (25ºC) WILL REDUCE BATTERY LIFE**.

5. The SSG Series UPS can be installed in either a free-standing mini-tower or into a 19 inch equipment rack. Follow the appropriate instructions in either Rackmount UPS Setup or Free-standing UPS Installation.

Rackmount UPS Setup

All SSG Series models are shipped with front panel mounting ears that allow the unit to be installed in a 19" equipment rack. Each UPS unit and external battery enclosure requires 2U (3.5 inches) of vertical rack space.

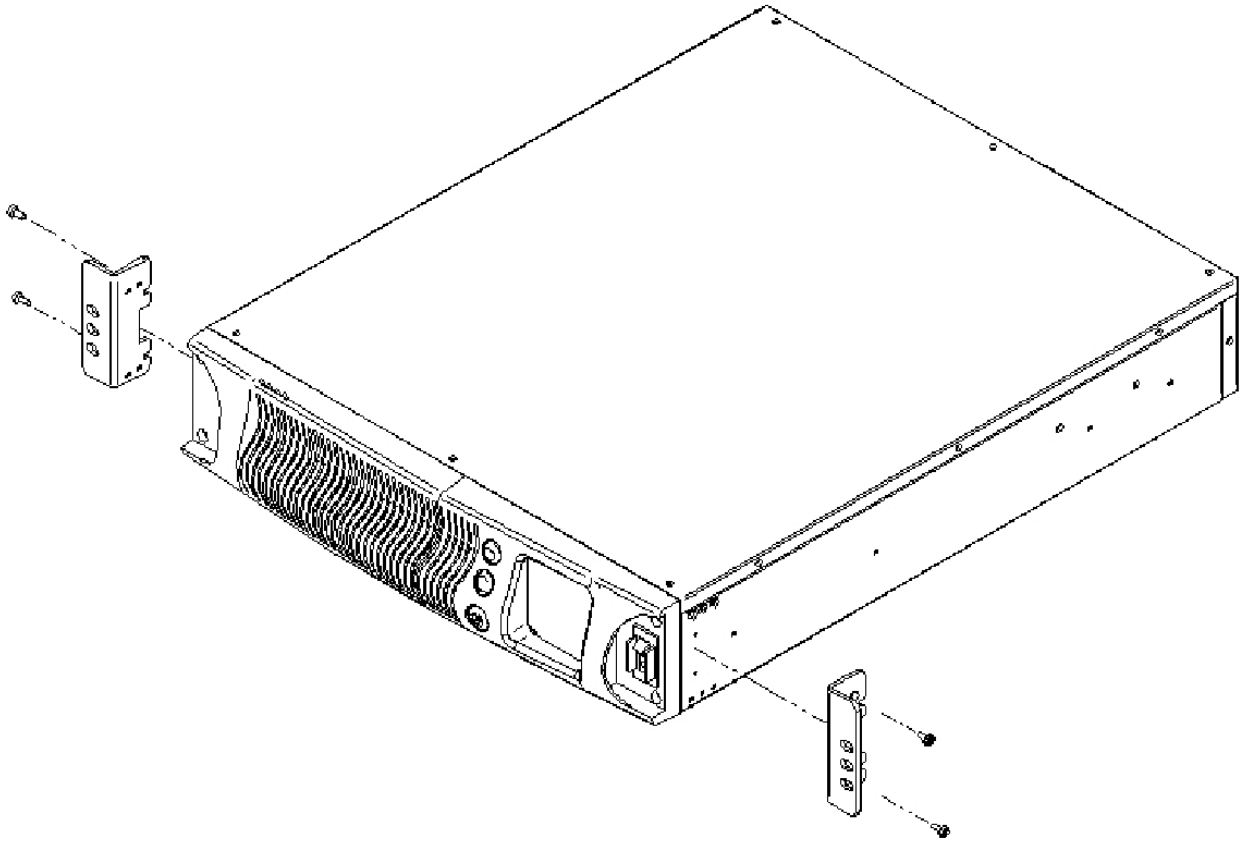
NOTE !

The rack-mounting ears **WILL NOT** support the weight of the UPS or battery bank by themselves. They are only to be used to secure the UPS to the front rails of the rack. Mounting rails or an equipment shelf are required to support the weight of each UPS or battery module.

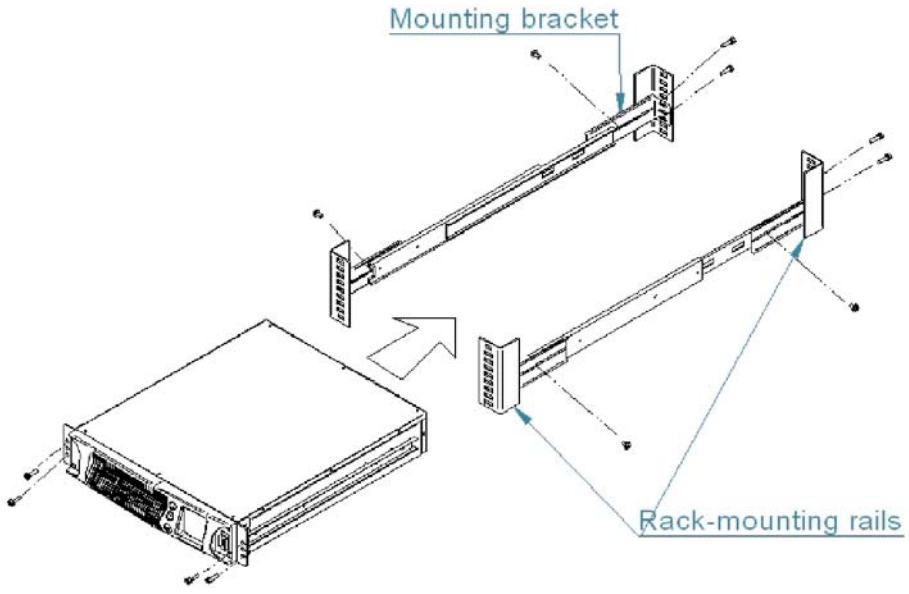
Use the following procedure to install the UPS in an standard 19” equipment rack:

1. Place the UPS on a flat, stable surface with the front of the UPS facing you.
2. Align the mounting ears with screw holes on the side of the UPS and secure with the supplied screws.
3. If installing the Battery Module, repeat above STEPS.
4. For slide rail installations, fasten the inner parts of the slide rails to the UPS on both sides with the screws provided.

CAUTION: When making battery bank connections to the UPS, alwasy verify the battery bank circuit breaker(s) are in the off position. PRIOR to turning on the first battery bank circuit breaker, ALWAYS DEPRESS AND HOLD THE BATTERY PRECHARGE PUSHBUTTON LOCATED ON THE UPS REAR PANEL WHILE TURNING ON THE FIRST BATTERY BANK CIRCUIT BREAKER TO PREVENT UPS DAMAGE



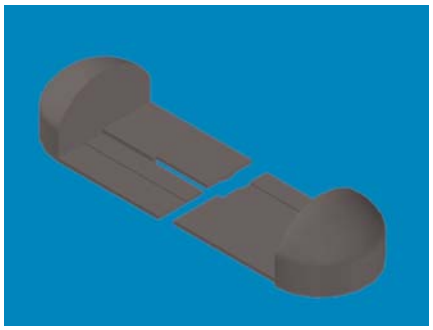
5. ** **Securing hardware, slide rails and rail extensions are sold separately**. Contact Falcon Electric for these additional options and any assistance needed.**
6. Attach the two mounting brackets to the rack's mounting rails. The brackets allow adjustment of up to eight inches of the slide assembly mounting position, front-to-back, on the rack-mounting rails. Determine which adjustment holes to use on the bracket, and attach it to the slide assembly on the stationary outer slide.



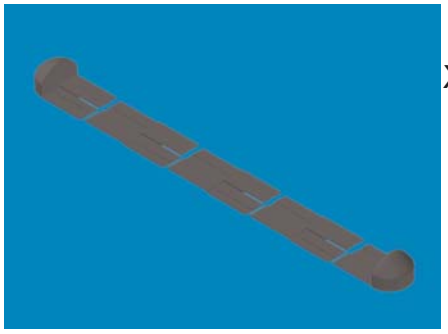
7. Install the slide assemblies, with brackets into the rack enclosure.
   The return flanges on the mounting brackets and outer parts fit to the inside of the rack-mounting rails.
8. Verify the slide assemblies are in the same alignment position on all four rack-mounting rails. After checking alignment, TIGHTEN ALL SCREWS.
9. Insert the UPS, with inner parts attached, into the slide assemblies. You may need to depress the locking mechanisms on the inner and outer parts of the slide assemblies to allow the slides to retract. The UPS should move smoothly forward and backward on the slide assemblies. If not, recheck alignment.
10. Once the UPS is installed in the rack, the load may be connected to the output of the UPS. Ensure the equipment being connected is turned off. Plug all loads into the output receptacles on the rear of the UPS. Plug the UPS into a dedicated wall receptacle that is protected by a circuit breaker or fuse in accordance with national and local electrical codes.
    Use a 15 amp rated device for 1500 VA units, 20 amp for the 2200VA, and 30 amp for 3000VA. The wall receptacle must be grounded.
11. To turn on the UPS, switch on the input circuit breaker; wait for the UPS to switch from bypass to inverter mode and then turn on the connected equipment.

Free-standing (tower) Installation (mounting feet to be purchased seperately)

When installing the SSG Series UPS in a free-standing configuration, mounting feet for the SSG1.5KRM-1 model may be purchased seperately to stableize the UPS
provided with mounting feet (shown below, left) to stabilize the UPS. The SSG2.2KRM-1 and SSG3KRM-1 models are provided with keyhole hardware to "lock" the UPS and battery bank units together. This key lock is also required if additional battery packs are added.

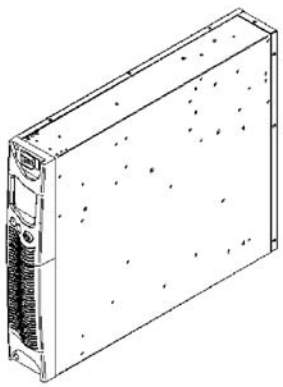


Mounting feet

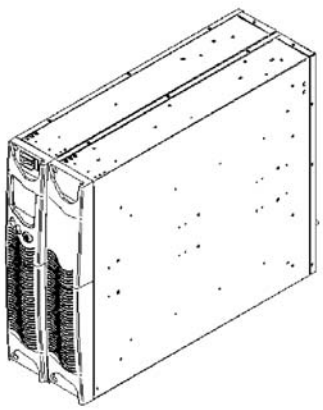


X

Mounting feet for additional battery banks



SSG1.5KRM-X Free Standing



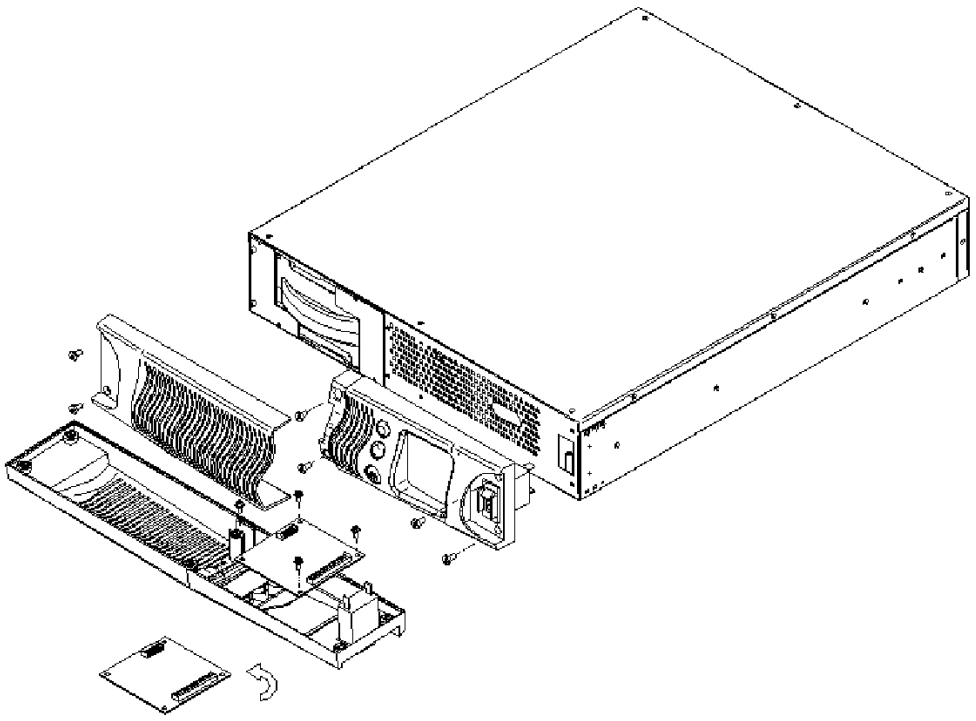
SSG2.2KRM-X & SSG3KRM-X Free Standing

LCD Display Repositioning

<u>WARNING</u>: Refer the repositioning of the LCD display to a qualified electronic technician or the Falcon Service Department. LIVE COMPONENTS ARE INSIDE THIS UPS AND RISK OF ELECTRICAL SHOCK.

Prior to anyone starting to attempt the repositioning of the LCD display, SERVICE PERSONNEL MUST FIRST disconnect the UPS line cord and power plug, remove the battery fuse located on the UPS rear panel, disconnect any external battery banks and let the UPS discharge for one hour.

The default LCD display mounting is for horizontal (Rackmount) viewing. To reorient the LCD display for vertical (Free Standing) viewing, remove the left half of the front plastic bezel by unscrewing the screws to the far left of the chassis. Next, remove the four screws securing the right plastic panel and pull the right panel forward evenly. Refer to the following figure, unscrew the LCD board and rotate it 90 degrees, to the correct position for viewing. Use care when handling the LCD display and associated cabling. Mount the front covers back and reinstall the screws.



SSG & HW Battery Bank Installation

(SSG1.5KRM-X internal battery, SSG2.2KRM-X & SSG3KRM-X standard battery bank and all SSG extended battery banks)

Note:
Additional battery banks can be connected to the UPS to provide additional battery run time.
There are two models of extended battery banks available for the SSG Series. Falcon model number SSGR is a universal battery bank without an internal charger. It may be added to any SSG 1.5-3kVA models. For 2.2-3kVA models, the addition of this type of extended battery bank will cause the stated recharge time to multiply by the number of battery banks added. The addition of more than three SSGR battery banks is not recommended. Use the SSGR-1 model universal extended battery models instead, as it incorporates internal battery chargers to assure proper battery recharging and greatly reduces the amount of battery recharge time.

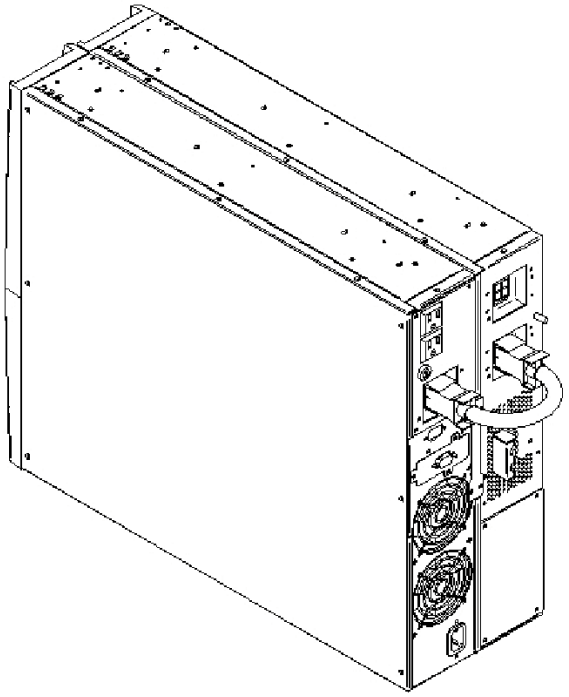
SSG Extended Battery Bank Information

UPS Model	EXTENDED BATTERY BANK (EBM) OPTIONS				UPS Battery Bus Voltage	Number of parallel battery strings	BACKUP TIME (1) (Models With & Without Charger	EXTENDED BATTERY BANK (EBM) OPTIONS (With Internal Battery Charger)							BATTERY BANK DIMENSIONS (Inches)
	Extended Battery Bank Model Number	# Of Battery Banks	Recharge Time in Hours (to 90%) (2)	Weight (lbs.)				Extended Battery Bank Model Number	# Of Battery Banks	Recharge Time in Hours (to 90%)	Charger Input Voltage & Current	Charger Output Voltage	Recharge Current	Weight (lbs.)	
SSG1.5KRM -1 &HW SSG1.5KRM -2 & HW	SSGR	1	18	40.5	48Vdc	3	30	SSGR-1 SSGR-2	1	6	-1 120Vac 3A -2 230Vac 1.5A	54Vdc	2A (2 Chargers @1A each	43.5	3.5 x 16.8 x 21.5 (each battery bank)
		2	35	81		5	56		2	7				87	
		3	56	121.5		7	87		3	7				130.5	
		4	64	162		9	118		4	8				174	
		5	80	202.5		11	148		5	8				217.5	
				243		13	184		6	8				261	
		7	150	283.5		15	221		7	8				304.5	
SSG2.2KRM -1 & HW SSG2.2KRM -2 & HW	SSGR	1	12	40.5	96Vdc	2	24	SSGR-1 SSGR-2	1	7	-1 120Vac 3A -2 230Vac 1.5A	109Vdc (2 x 54Vdc)	2A (2 Chargers @1A each	43.5	3.5 x 16.8 x 21.5 (each battery bank)
		2	18	81		3	42		2	7				87	
		3	25	121.5		4	63		3	8				130.5	
		4	35	162		5	83		4	8				174	
		5	46	202.5		6	104		5	8				217.5	
		6	56	243		7	125		6	8				261	
		7	68	283.5		8	146		7	8				304.5	
SSG3KRM-1 & HW SSG3KRM-2 & HW	SSGR	1	12	40.5	96Vdc	2	14	SSGR-1 SSGR-2	1	6	-1 120Vac 3A -2 230Vac 1.5A	109Vdc (2 x 54Vdc)	2A (2 Chargers @1A each	43.5	3.5 x 16.8 x 21.5 (each battery bank
		2	18	81		3	27		2	7				87	
		3	25	121.5		4	41		3	8				130.5	
		4	35	162		5	56		4	9				174	
		5	35	202.5		6	71		5	8				217.5	
		6	56	243		7	87		6	8				261	
		7	68	283.5		8	103		7	8				304.5	

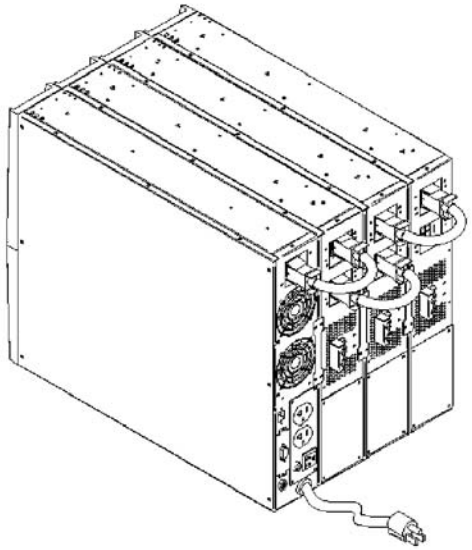
1. BATTERY TIMES ARE IN MINUTES @ FULL LOAD AND INCLUDE UNITS INTERNAL BATTERIES ON 1KVA UNIT. (TIMES ARE APPROXIMATE AND SUBJECT TO TEMPERATURE, CONDITION AND TYPE OF LOAD).
2. RECHARGE TIME WITH INTERNAL UPS CHARGER ONLY

Battery Bank Installation Procedure

The battery modules have been designed to be placed on one side of the UPS as shown below.

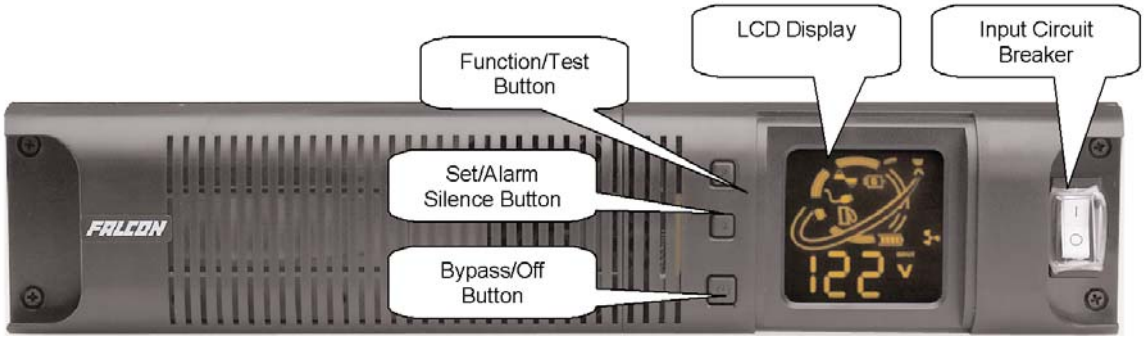


1. Visually inspect the battery module for any freight damage. Report damage to the carrier and Falcon Electric immediately.
2. Use the mounting feet to secure the unit and to prevent them from tipping over. One additional set of mounting feet base extensions ships with each battery bank.
3. Turn off the battery disconnect switch and connect the supplied battery bank cable to the UPS connector located on the rear of the battery bank. Next connect the other end of the cable to the battery bank connector located on the rear of the UPS as shown.
4. Turn on the battery disconnect switches located on the back on the rear of the battery bank(s).



4.0 DISPLAY & CONTROLS

The diagram below shows the basic functions of the front panel for all SSG Series 1.5-3kVA UPS models.



Indicators and Icons located on the LCD models LED display:

Green Mode: The bulb icon is displayed continuously when the Green Mode function is enabled. It will be flashing when the UPS has switched to Green Mode due to the UPS output load decreasing to less than 3% of the total UPS output rating. The UPS is shipped with the Green Mode disabled. See Green Mode setting instructions.

Audible Alarm: The speaker icon will be displayed during an alarm condition. It will be flashing when the audible alarm has been silenced.

UPS Fault Condition: This icon will be displayed when an alarm condition exists. Refer to page 29 of this manual and attempt to correct the alarm condition.

Test: The Test icon will be displayed and flash whenever the UPS is conducting a Self/Battery Test. *Not on LED models.*

Output Load %: The greater the load, up to three vertical bars will be illuminated at the ends of the icon. Each bar represents 25% of the UPS output rating.

Inverter Status: This icon will be displayed when the UPS is in Inverter mode.

PFC Status: This icon will be displayed with PFC is functioning.

Utility Power Status: The Line Cord icon will be displayed when utility power is present.

Charger Status: When the battery charger is operating, the gas pump icon will be displayed.

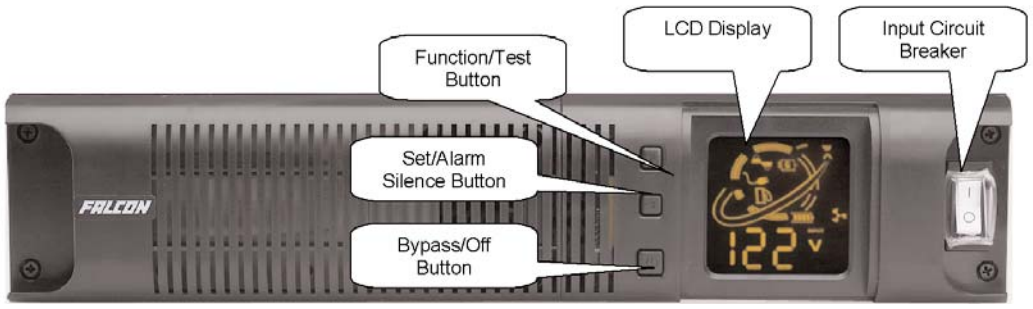
Battery Mode: When the UPS is in battery mode this icon will be displayed.

Battery Level: The battery icon or LED indicates the battery capacity. The more battery capacity available, the more bars that will be illuminated. Each bar represents 25%.

Fan in high speed mode: The HS Fan icon is displayed when the UPS cooling fan is in high speed mode, typically during battery mode operation.

Fan in medium speed mode: The MS Fan icon is displayed when the UPS cooling fan is in medium speed mode, typically when utility is present.

Fan in low speed mode: The LS Fan icon is displayed when the UPS cooling fan is in low speed mode, typically when the UPS is in bypass.



Controls (all models):
The primary front panel user controls consist of one input circuit breaker and three push-buttons: The switch located to the right of display is the main input circuit breaker and controls the connection of utility power to the UPS and its internal battery charger.

The three buttons located to the left of the LCD display are for primary manual control and programming of the UPS. From top to bottom they are designated "Function/TEST", "Set/Alarm Silence", and "Bypass".

Function/Test Button
This button has two functions:

1 Initiates internal UPS Setup mode to allow for configuration changes. Setup mode is initiated by pressing both the "Function/Test" and Set/Alarm buttons down and holding them for one second.
2 Manual Battery Test - If depressed for less than three seconds, it initiates an immediate battery test.

Manual Battery Test Description - When the UPS is operating normally from utility power, pressing the test button will cause the UPS to test the voltage status of the batteries for 10 seconds. During that period, the battery, if first determined to be good, will supply power to the UPS. Should defective batteries be detected, the audible alarm will sound one long tone, and the UPS will continue to operate from the utility voltage, without going to battery mode. During the battery test, the output of the UPS will not be adversely affected.

Set/Alarm Silence Button
This button has three functions:

1 Disables the audible alarm buzzer
2 Scrolls the display through the various UPS parameters.
3 Sets configuration changes (when pressed in setup mode only).

Disable the Audible Alarm - Pressing the button for one second will turn off the audible alarm. This will cause future notification of minor alarms to be silenced.

NOTE!
THE FOLLOWING ALARMS CANNOT BE SILENCED:
OVER TEMPERATURE, PFC OVER CURRENT, INVERTER OUTPUT OVER LOAD, LOW BATTERY AND UPS OR CHARGER FAILURE.

How to Display The UPS Parameters - Repeat pressing of the Set/Alarm button will cause UPS input and output parameters to be displayed on the lower portion LCD display in the following order. The input voltage, output voltage, output frequency, battery voltage, percentage of output load, input current, internal UPS temperature and the output current.

CAUTION

When the UPS is in Normal On-line mode, pressing the bypass button once will put the UPS into Bypass Mode. While in bypass, should the utility power become unavailable, the UPS output will turn off and the UPS will shut down.

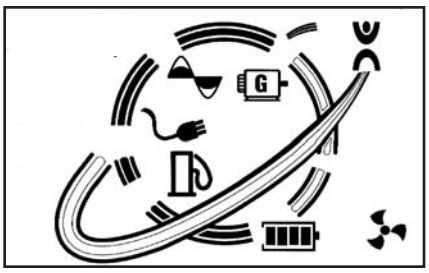
Once the unit is in Bypass Mode operation, pressing this button again will force UPS back to on-line mode operation.

5.0 UPS OPERATION

OPERATING MODES (LCD models only, LED models are self-explanatory)
The following outlines the UPS status for each mode of operation as displayed by the LCD.

NORMAL ON-LINE MODE OPERATION

During normal on-line operation, utility power provides energy to the UPS. The filters, power factor corrector and the inverter process the power to provide computer grade power to connected loads. The UPS maintains the batteries in a fully charged state.



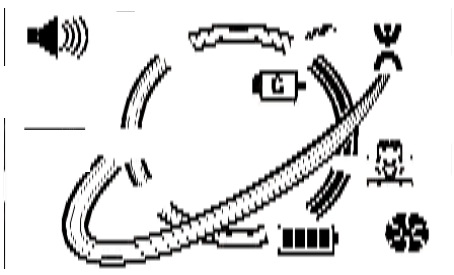
The LCD display icon configuration on the left indicates on-line mode operation, indicating the percent of load, inverter, PFC, line, charger and battery operation and status. The fan is shown at medium speed.

The dark, solid line on the MIMIC portion of the display indicates the normal mode power flow from input, through the inverter, to load and from the input, to the charger and into the battery.

BATTERY MODE OPERATION

The battery mode icon configuration is displayed during a loss of utility power or during excessively high line voltage conditions. When in battery mode, the UPS battery supplies energy to the DC to DC converter, and then on to the inverter, which powers the connected load. During the battery discharging, the audible alarm will beep. The rate of the beeping will increase as the battery runs low (low battery), prior to UPS shut down. Once the low battery warning is sounded, there will be about one minute of battery runtime remaining.

After the UPS has shut down, when utility power has been restored, the UPS will automatically restart. For approximate battery run times, refer to the specifications and extended battery runtime chart in this manual. The runtime is based on a resistive load being connected to the UPS output, and an ambient temperature of 77ºF (25ºC).



The LCD display icon configuration on the left indicates the UPS is in Battery Mode. The dark solid line indicates battery power flow to the DC to DC converter and on to the inverter. The fan is shown in high speed mode. The bars inside the battery icon indicate the amount of battery capacity remaining; each bar represents a 25% capacity increment. As capacity decreases, fewer bars will remain illuminated. The charger icon is turned off.

BYPASS MODE OPERATION

The UPS will automatically transfer to Bypass Mode in the event it is overloaded, experiences an internal failure and for the conditions listed below. When in bypass, the UPS will transfer the connected load directly to the incoming utility power. *When in bypass mode, Battery Mode will not be available*. However, the utility power will continue to be passively filtered by the UPS. Additionally, the UPS will sound an audible alarm and switch to Bypass Mode automatically upon the following conditions:

* The UPS has experienced an over temperature condition.
* The UPS has experienced an overload condition of 101 to 110% for over 120 seconds.
* The UPS has experienced an overload condition of 111 to 150% for over 20 seconds.
* The UPS has experienced an overload condition of over 150%.
* The UPS detects a fault in the battery or UPS electronics.

The LCD display icon configuration on the left indicates the UPS is in Bypass Mode. The dark solid line shows the input connected directly to the connected load. Another dark solid line shows the input power to the battery charger icon, then to the battery. The Fan is shown in low speed mode.

GREEN MODE OPERATION

When Green Mode is turned on using the UPS programming interface, the SSG unit will automatically switch to "Green Mode" (Bypass Mode), once the connected load drops to less than 3% of the UPS's rated output. The load will operate directly from utility power, similar to Bypass Mode. The LCD display will indicate the UPS is in Bypass Mode, the Green Mode bulb icon will be flashing. If the load is increased to over 3% of the UPS output rating, the UPS will automatically switch back to normal on-line operation. All SSG models are shipped from the factory with Green Mode turned off. To enable Green Mode, refer to the section on UPS Setup, Configuration & Programming. See the green mode configuration section for further details and cautions.

How to Turn On the UPS (with utility power)

Once installation has been complete, the UPS can be powered up. With utility power present, turn on the UPS input circuit breaker located on the front panel. The UPS will enter an Auto-Test state and all of the LCD indicators will be illuminated flashing for ten seconds and then return to a normal state. The UPS will start up in bypass mode and after several seconds, should transfer to the normal on-line mode.

How to DC Start the UPS (without utility power)

In the event utility power is not available, the UPS may be started up in battery mode. To turn on the UPS without utility power available, press and hold the "BYPASS" button. The UPS will start on battery and supply power to the connected loads until the batteries are depleted. Always recharge the batteries immediately by connecting the UPS to utility power and turning on the UPS input circuit breaker after any full battery discharge. For DC start operation the load segment control must be set to Continuous Mode operation.

How to Turn Off the UPS

To turn off the UPS:
While in normal on-line mode, press the Bypass button for one second. The UPS will go into Bypass Mode. Next, turn off the input circuit breaker. The unit will shut down after about 30 seconds.

While in battery mode: Press the Bypass button for one second. The unit will shut down after about 30 seconds.

NOTE!
DURING SHUT DOWN, DO NOT PRESS ANY BUTTON SINCE UPS MIGHT BE RE-ENERGIZED AND DELIVER POWER TO ITS OUTPUT UNEXPECTEDLY.

6.0 UPS SETUP, CONFIGURATION & PROGRAMMING

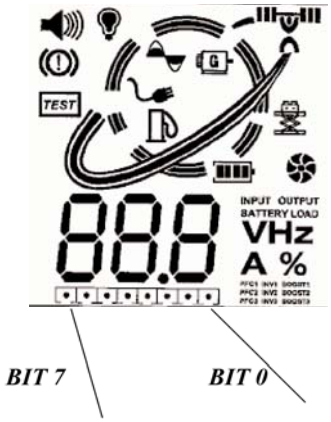
The following section describes how to reconfigure the internal UPS setup options, by using the Setup, Configuration & Programming Mode. The setup options include: The UPS output voltage, enabling or disabling Green Mode and output Segment Control operational mode settings.

CAUTION

Never change the voltage settings when the UPS is ON and powering any connected loads.

How To Place the UPS Into Setup/Configuration Mode

To place the UPS into configuration mode: press the "Function/Test" and "Set/Alarm Silence" buttons at same time and hold them for one second. The unit will emit one audible beep and display function and status bit window at the bottom of the LCD display, entering Configuration Mode.



Note on the bottom of the display panel, you will see a single row, 8 BIT column located at the bottom of the display. The right most bit is function BIT 0, with the remaining seven bits to the left, function bits 1 through 6. The last BIT 7 is the Status Bit and will indicate the setting status of the other Function bits. Repeat pressing of the "Function/Test" button will move the dot from function BIT 0 (far right) to function BIT 6. When selecting function BIT 0 through BIT 6, observe whether status BIT 7 has a (Dot) or (No Dot) displayed for the function bit selected. To select a dot or no dot for the function you are presently in, press the "Set/Alarm Silence" button to turn on (Dot) or turn off (No Dot) in status BIT 7. Next, press the “Set/Alarm Silence" and “Function/Test" buttons at same time, and hold for one second. The audible alarm will sound one short beep to acknowledge the UPS has stored the selected settings.

Setting the Green Mode Function (set to disabled from factory)

Green Mode is a power saving feature that should only be used in non-critical applications when the connected computer or equipment is the only device being protected by the UPS and when turned off, UPS battery backup is no longer necessary. When the Green Mode is enabled and the connected load decreases to less than 3% of the full rated UPS output capacity, the UPS will automatically switch from on-line to Bypass Mode, 30 seconds after the drop in load has been detected. After the UPS has switched to Bypass Mode, the Green Mode bulb icon will flash to indicate the UPS is in the energy saving Green Mode. While in Green Mode, should the load increase to greater than 3% of the UPS's full output rating, the UPS will automatically return to normal On-line Mode operation.

CAUTION- When Green Mode is enabled, and the UPS has switched to Bypass Mode due to a reduction in load, **THE UPS WILL NOT GO TO BATTERY MODE IN THE EVENT OF A UTILITY FAILURE. THE CONNECTED LOAD WILL BE TURNED OFF. Turning Green Mode off in configuration mode will restore normal UPS operation.**

Green Mode Setup

Status Bit 7	Function Bit 6	Function Bit 5	Function Bit 4	Function Bit 3	Function Bit 2	Function Bit 1	Function Bit 0
Set or Clear	LSC#2 Low Batt	LSC#2 Uty. Loss	LSC#1 Low Batt.	LSC#1 Uty. Loss	Green Mode	120V or 240V- On 115V or 230V– On 110V or 220V– Off 100V or 208V - Off	120V or 240V – On 115V or 230V – Off 110V or 220V – On 100V or 208V - Off

How to Enable or Disable Green Mode (Function Bit 2)

To Enable:

1. Press the "Function/Test" and "Set/Alarm Silence" buttons at same time and hold them for one second. The unit will sound one beep and then enter the Configuration Mode.
2. Press the "Function/Test" button two times to move the dot from function BIT 0 to function BIT 2 (The Green Mode function).
3. Press the "Set/Alarm Silence" button to enable (NO DOT) BIT 7. (The reverse of other feature enable settings)
4. Press the "Set/Alarm Silence" and "Function/Test" buttons at same time again and hold for one second. The alarm will sound one short beep to acknowledge the UPS has stored the setting.

To Disable: (Factory Default)

1. Press the "Function/Test" and "Set/Alarm Silence" buttons at same time and hold them for one second. The unit will sound one beep and then enter the Configuration Mode.
2. Press the "Function/Test" button two times to move the dot from function BIT 0 to function BIT 2 (Green Mode function).
3. Press the "Set/Alarm Silence" button to turn off (DOT) BIT 7. (The reverse of other feature disable settings)
4. Press the "Set/Alarm Silence" and "Function/Test" buttons at same time again and hold for one second. The alarm buzzer will sound one short beep to acknowledge the UPS has stored the setting.

How to Set the UPS Output Voltage (Function Bits 0 & 1)

The SSG Series UPS is shipped configured from the factory with its output voltage set to 120Vac. **For most North American applications, the UPS output voltage will not have to be changed.**

CAUTION: NEVER CHANGE THE UPS OUTPUT VOLTAGE WHILE IT HAS EQUIPMENT CONNECTED TO ITS OUTPUT RECEPTACLES.

Make output voltage configuration changes and verify the desired output voltage is present at the UPS output using the UPS output voltage display function. Next, verify that all of the equipment to be connected to the UPS will operate satisfactorily on the newly selected output voltage.

CAUTION: **When the UPS output voltage is set to 100Vac, the maximum amount of load that can be connected to the UPS must be derated (reduced) by 15%.**

Output Voltage	Function BIT(s)	Status Bit (BIT 7)
120Vac	BIT 0 & BIT 1	For BIT 0, set bit 7 On (Dot), For BIT 1, set bit 7 On (Dot) **(default)**
115Vac	BIT 0 & BIT 1	Fro BIT 0, set bit 7 Off (No Dot), For BIT 1, set bit 7 On (Dot)
110Vac	BIT 0 & BIT 1	For BIT 0, set bit 7 On (Dot), For BIT 1, set bit 7 Off (No Dot)
100Vac	BIT 0 & BIT 1	For BIT 0, set bit 7 Off (No Dot), For BIT 1, set bit 7 Off (No Dot)

Output Voltage Select Setup

Status Bit 7	Function Bit 6	Function Bit 5	Function Bit 4	Function Bit 3	Function Bit 2	Function Bit 1	Function Bit 0
Set Or Clear	LSC#2 Low Batt	LSC#2 Uty. Loss	LSC#1 Low Batt.	LSC#1 Uty. Loss	Green Mode	120V or 240V- On 115V or 230V – On 110V or 220V – Off 100V or 208V - Off	120V or 240V – On 115V or 230V – Off 110V or 220V – On 100V or 208V - Off

Example - How to Set the UPS Output Voltage to 115Vac (-1 models) or 230Vac (-2 Models)

1. Press the "Function/Test" and "Set/Alarm Silence" buttons at same time and hold them for one second. The unit will emit one alarm beep and then enter the Configuration Mode.
2. Press the "Function/Test" button eight times to move the dot to function BIT 0.
3. Press the "Set/Alarm Silence" button turn off (no dot) Status BIT 7.
4. Press the "Function/Test" button one time and move the dot to function BIT 1.
5. Press the "Set/Alarm Silence" button to turn on (dot) Status BIT 7.
6. Press the "Set/Alarm Silence" and "Function/Test" buttons at same time again and hold for one second. The alarm buzzer will sound one short beep to acknowledge the UPS has stored the settings.
7. **You must now restart the UPS before the new voltage setting will be in effect.**

How to Set the UPS Load Segment Control Options (Function Bits 3, 4, 5 & 6)

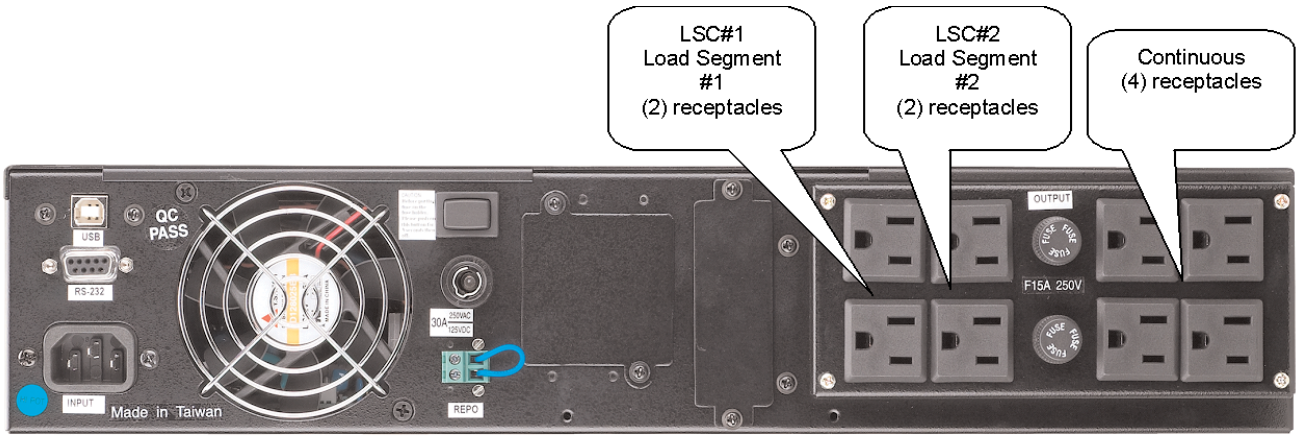
Three conditions of automatic load segment control may be programmed for two separate output load segments. Additionally, one continuous load segment is provided. Per the model-specific rear panel pictures that follow, the two programmable and one continuous load segments are assigned to specific output receptacles located on the UPS rear panel.

For each programmable load segment, the following conditional states may be selected:

1. Turn off the assigned load segment when utility power is lost (bits 3 & 5)
2. Turn off the assigned load segment whenever low battery is reached (bits 4 & 6).
3. Load segment bits are turned off making the load segment continuous.

Load Segment Control Setup

Status Bit 7	Function Bit 6	Function Bit 5	Function Bit 4	Function Bit 3	Function Bit 2	Function Bit 1	Function Bit 0
Set Or Clear	LSC#2 Low Batt	LSC#2 Uty. Loss	LSC#1 Low Batt.	LSC#1 Uty. Loss	Green Mode	120V or 240V- On 115V or 230V – On 110V or 220V – Off 100V or 208V - Off	120V or 240V – On 115V or 230V – Off 110V or 220V – On 100V or 208V - Off



Making Load Segment Settings

A. Setting load segments to automatically turn off the load segment when utility power is lost

1. Press the "Function/Test" and "Set/Alarm Silence" buttons at same time and hold them for one second. The unit will emit one alarm beep and then enter the Configuration Mode.
2. Press the "Function/Test" button repeatedly and move the dot to function BIT 3 (for load segment 1), or BIT 5 (for load segment 2).
3. Press the "Set/Alarm Silence" button once to turn on (dot) Status BIT 7.
4. Press the "Set/Alarm Silence" and "Function/Test" buttons at same time again and hold for one second. The alarm buzzer will sound one short beep to acknowledge the UPS has stored the settings.

B. Setting load segments to automatically turn off the load segment at low battery

1. Press the "Function/Test" and "Set/Alarm Silence" buttons at same time and hold them for one second. The unit will emit one alarm beep and then enter the Configuration Mode.
2. Press the "Function/Test" button repeatedly and move the dot to function BIT 4 (for load segment 1), or BIT 6 (for load segment 2).
3. Press the "Set/Alarm Silence" button once to turn on (dot) Status BIT 7.
4. Press the "Set/Alarm Silence" and "Function/Test" buttons at same time again and hold for one second. The alarm buzzer will sound one short beep to acknowledge the UPS has stored the settings.

C. Setting load segments for continuous mode operation

1. Press the "Function/Test" and "Set/Alarm Silence" buttons at same time and hold them for one second. The unit will emit one alarm beep and then enter the Configuration Mode.
2. Press the "Function/Test" button repeatedly and move the dot to function BIT 3 (for load segment 1), or BIT 5 (for load segment 2).
3. Press the "Set/Alarm Silence" button once to turn off (no dot) Status BIT 7.
4. Press the "Function/Test" button repeatedly and move the dot to function BIT 4 (for load segment 1), or BIT 6 (for load segment 2).
5. Press the "Set/Alarm Silence" button once to turn off (no dot) Status BIT 7.
6. Press the "Set/Alarm Silence" and "Function/Test" buttons at same time again and hold for one second. The alarm buzzer will sound one short beep to acknowledge the UPS has stored the settings.

7.0 COMMUNICATIONS

All SSG Series UPSs are provided with the following communication ports:

* RS-232 port with standard DB-9F serial port connector.
* USB port supporting the connection of a standard USB interface cable.
* One advanced communications option slot is provided on the rear panel of the UPS. Unless an advanced communications option board has been previously purchased and installed, the port will be covered with a small cover plate. This plate will be secured with screws.

CAUTION: NEVER INSTALL OPTION CARDS THAT HAVE NOT BEEN SUPPLIED BY FALCON ELECTRIC OR ARE FOR ANOTHER FALCON MODEL WITHOUT CONSULTING WITH FALCON SERVICE.

Advanced communications option cards available from Falcon are:

Internal SNMP/HTTP Agent Board
Standard Dry Contact Interface Board

Note: A special external SNMP/HTTP Agent device is available that may be connected to the UPS's RS-232 port. This allows for one dry contact interface board to be installed into the Advanced Communications Option Slot concurrently.

CAUTION: When an internal SNMP/HTTP AGENT device is installed into the Advanced Communications Option Slot, the RS-232 port and UPSilon software may not be used. The USB port may be used in conjunction with UPSilon software concurrently with the SNMP/HTTP agent.

RS-232 & USB Ports

This UPS is equipped with (1) RS-232 and (1) USB port located on the UPS rear panel. A standard RS-232C interface cable is provided to allow for the connection of the UPS to another RS-232 port found on most computers. The USB port interfaces with a standard USB cable to be supplied by the end-user. The USB cable required is a - 4 Pin USB Type A (M) connector - 4 PIN USB Type B (M) connector. The USB and RS-232 ports cannot be used concurrently. When an RS-232 or USB cable has been connected, and the supplied UPSilon Computer Shutdown and Management software has been properly installed on the connected computer, a high level of UPS management and protection against lost or corrupted files is in effect. **Please follow the installation and setup instructions supplied on the UPSilon software CD.**

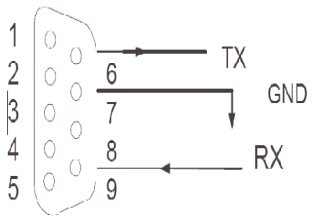
The UPSilon users manual is also located on the UPSilon CD supplied with this unit. UPSilon supports most popular operating systems. Should you have special UNIX requirements, please contact Falcon Sales for information and pricing of UPSilon for UNIX.

PIN #	*PIN Definition (UPS)*	*PIN Definition (PC)*
2	*Transmitted data*	*Received data*
3	*Received data*	*Transmitted data*
4	*DTE Ready*	*DTE Ready*
5	*Signal Ground*	*Signal Ground*

The supplied Falcon RS-232 interface cable pin designations are as follows:

UPSILON 2000 & SEC Smart Mon

BAUD RATE ------- 2400bps
DATA LENGTH---- 8 bits
STOP BIT---------- 1 bit
PARITY---------- None



DB-9 Connector Pin Assignment

Pin #	Function explanation	I/O
9	RS 232 Rx	INPUT
6	RS 232 Tx	OUTPUT
7	Ground	

The computer RS-232 Port settings should be set to the following:

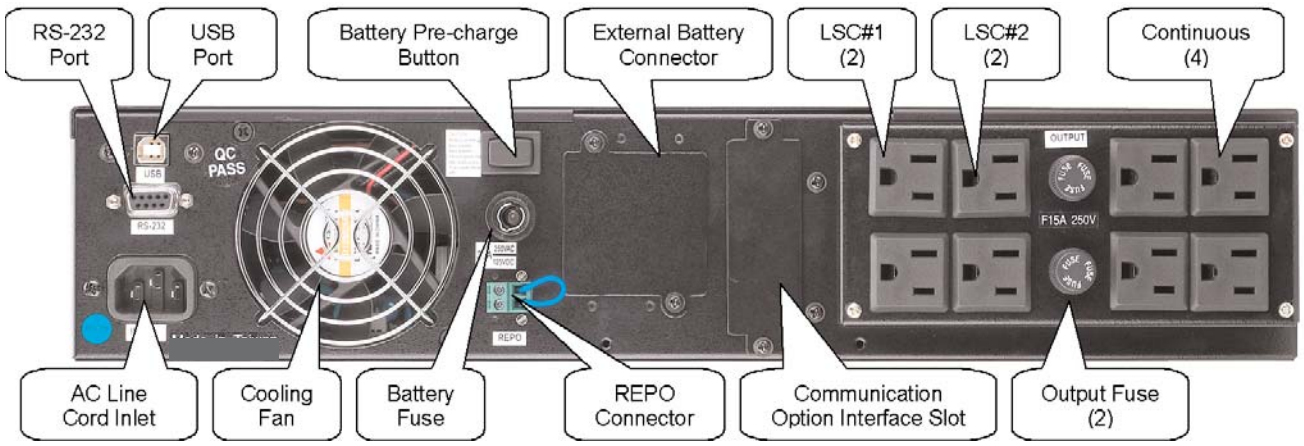
Baud Rate	***2400 bps***
Data Length	***8 bits***
Stop Bit	***1 bit***
Parity	***None***

Remote Emergency Power Off (REPO)

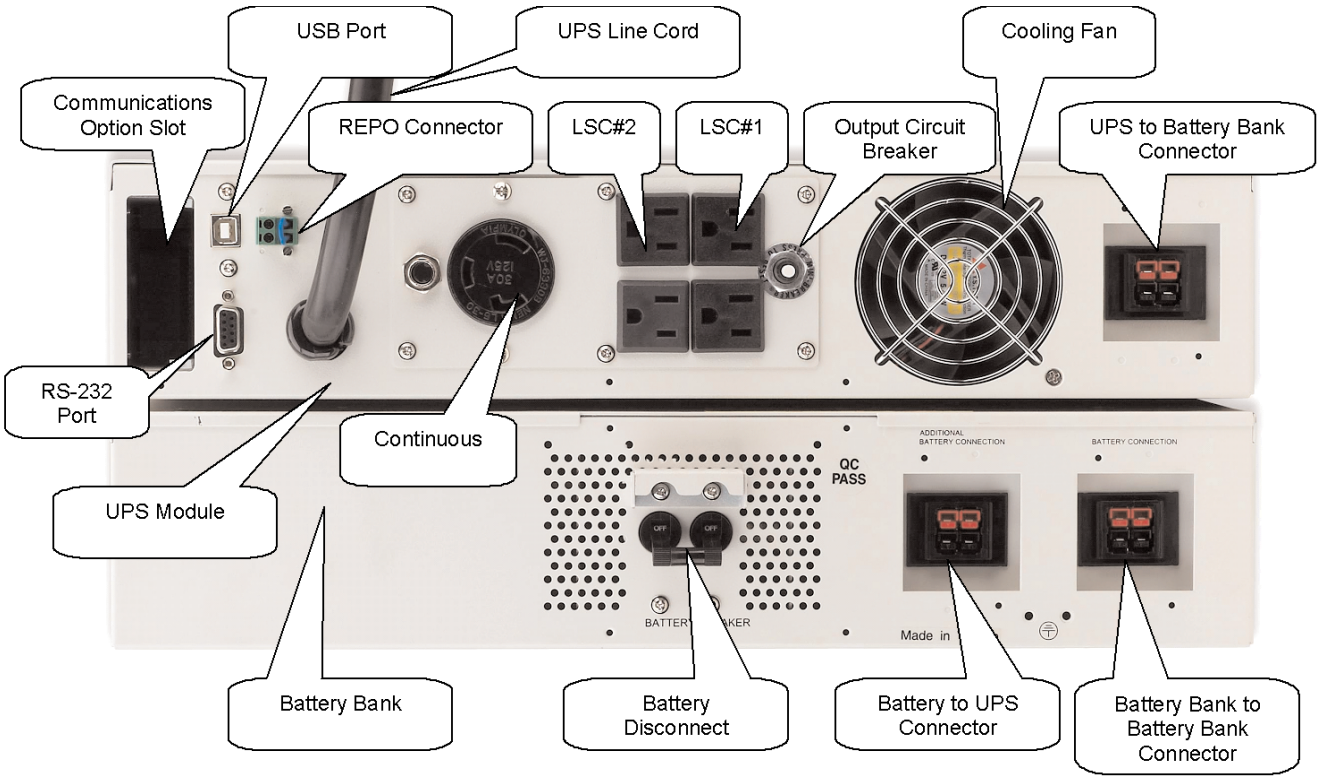
A two-pin REPO connector is located on the rear panel of the UPS. The connector is shipped with a jumper wire installed, to facilitate the normal operation of the UPS in the event an REPO connection is not used.

The REPO function provides an interface for a NFPA 70, NEC 645-11 compliant Remote Emergency Power Off (REPO) switch. The switch must have a normally-closed contact state that opens when the REPO button is depressed (REPO ACTIVE).

When the REPO switch contacts are opened, which also turns the equipment room power and UPS power off, the UPS output will immediately turn off all connected loads and then will shut down within one minute. When the REPO switch contacts are closed, restoring the equipment room's power, the UPS will restart.

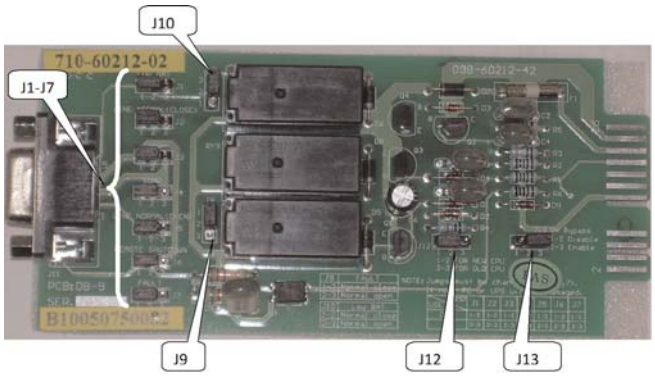


SSG2.2KRM-1 & SSG3KRM-1 Rear Panel Layout



Contact Closure Interface Card Option (New UA88374-SSG) Replaces UA88374

Note: This card installs into the Communicaitons Option Slot



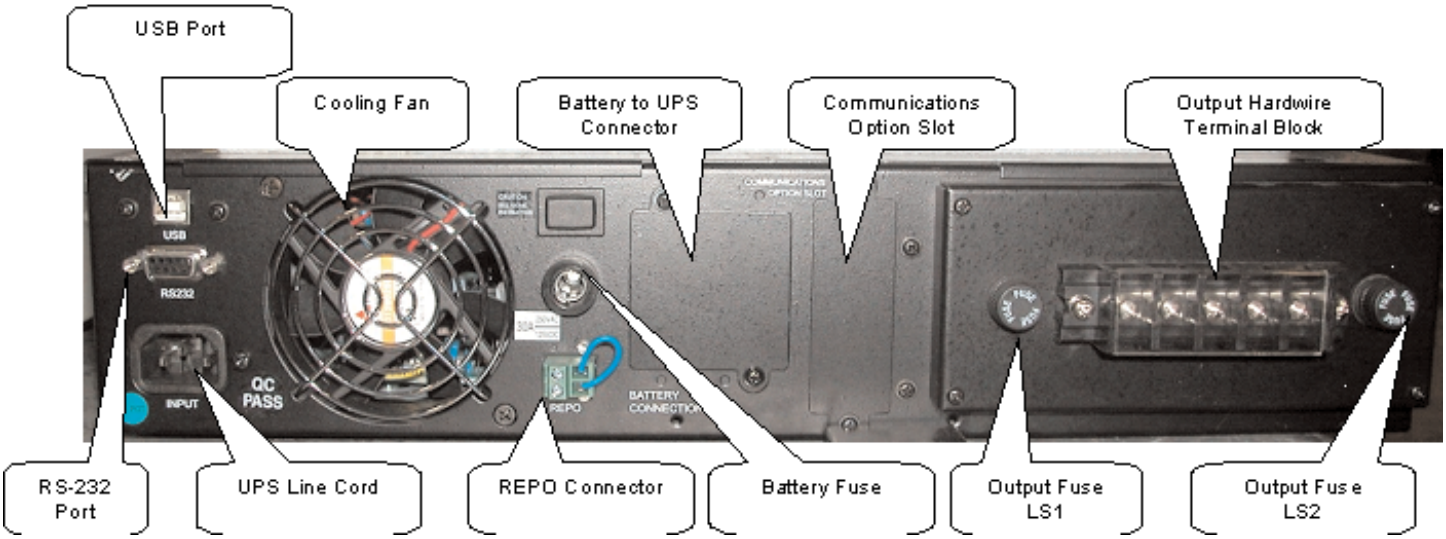
JUMPER SETTINGS

J1 through J7 = 1-2 DB-9 configured for Green cable (Default)
J1 through J7 = 2-3 DB-9 configured for standard RS-232 cable
Note: J1-J7 must be all configured 1-2 or 2-3, or UPS and PC may be damaged.
J9 Summery Alarm - 1-2 Normally Closed (Default), 2-3 Normally Open
J10 Low Battery = 1-2 Normally Closed, 2-3 Normally Open (Default)
J12 Model Selection = 1-2 XG & SSG Models, 2-3 IG & SVR-Pro-2 Models
J13 On-Bypass = 1-2 Disable, 2-3 Enable (Default)

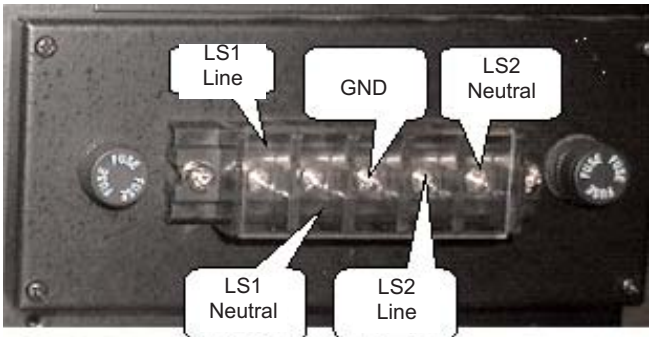
DB-9 PIN ASSIGNMENTS

1 = Not Used
2 = Utility Loss, Normally Open
3 = Utility Loss, Normally Closed
4 = Common (tied to pin 7)
5 = Low Battery
6 = Remote Shutdown (5-12Vdc)
7 = Common (tied to pin 4)
8 = Alarm / Bypass
9 = Not Used

SSG2.2KRM-HW & SSG3KRM-HW Rear Panel Layout



OUTPUT WIRING DETAILS



8.0 MAINTENANCE

All SSG Series UPS requires very little maintenance. The batteries are located inside user replaceable packs containing (4) CSB XTV1272 or equivalent, sealed, VRLA, maintenance-free,lead-acid batteries.

Batteries must be kept recharged to prevent excessive self-discharging, which may result in their premature failure. **The UPS will continuously recharge the batteries when plugged in and turned on.**

1. The UPS and Battery Care

Keep the area around the UPS clean and dust free. If the area around the UPS becomes very dusty, clean the area and the UPS with a vacuum cleaner. To assure the full 3-5 year battery life, keep the UPS at an ambient temperature of 25ºC (77ºF).

2. Storing the UPS and Batteries

When storing the UPS for any length of time, it is recommended to plug and turn on the UPS for at least 24 hours, every four to six months to ensure full recharging of the batteries. This will prevent excessive battery self-discharge.

3. When to Replace Batteries

We suggest the battery pack(s) containing 10-12 year batteries, have the batteries replaced every 8-10 years for SSG units that are operated and maintained in a 25ºC environment. Higher temperature operating environments will decrease the battery life. For 10-12 year batteries installed in a 50ºC enviroments, they will need to be replaced about every four years.

In order to assure the performance of the SSG Series UPS, check the battery every two to three months by pressing "Function/Test" button and conducting a battery test. If the UPS goes back to normal On-line Mode in less than 10 seconds with one long beep, the batteries need replacing. Contact Falcon Electric Service Department to order replacement battery packs.

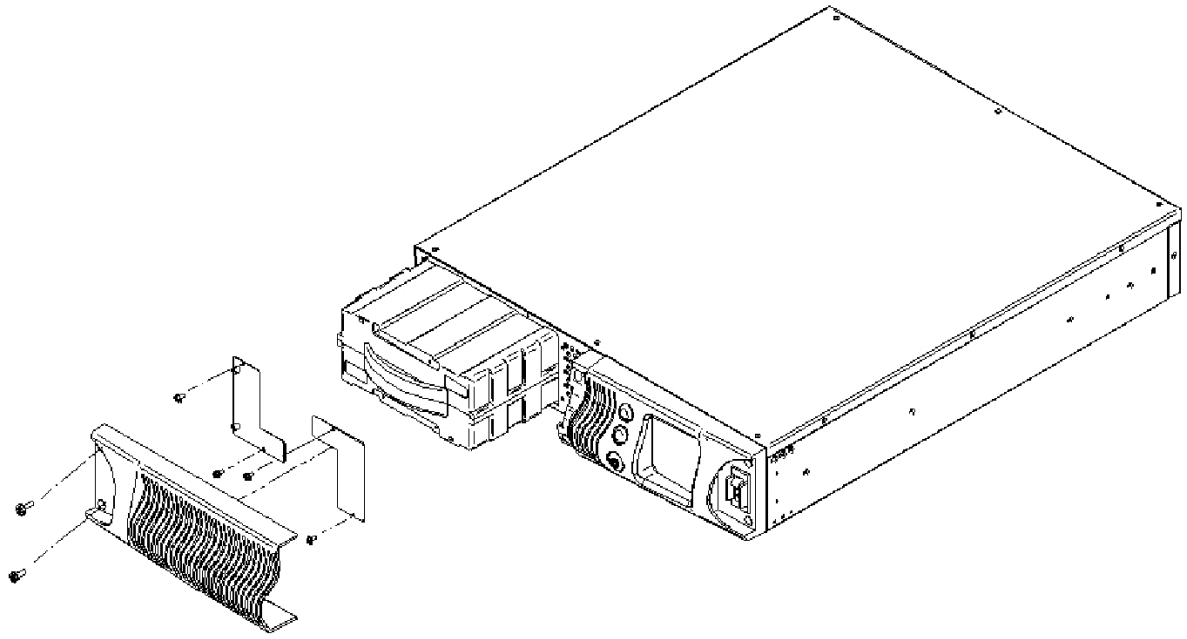
4. Battery Pack Replacement

With the hot-swappable battery pack feature, the SSG Series UPS battery pack is easily replaced, without having to turn the UPS off or disconnecting the load. Refer to the battery replacement section of this manual for replacement instructions.

NOTE!

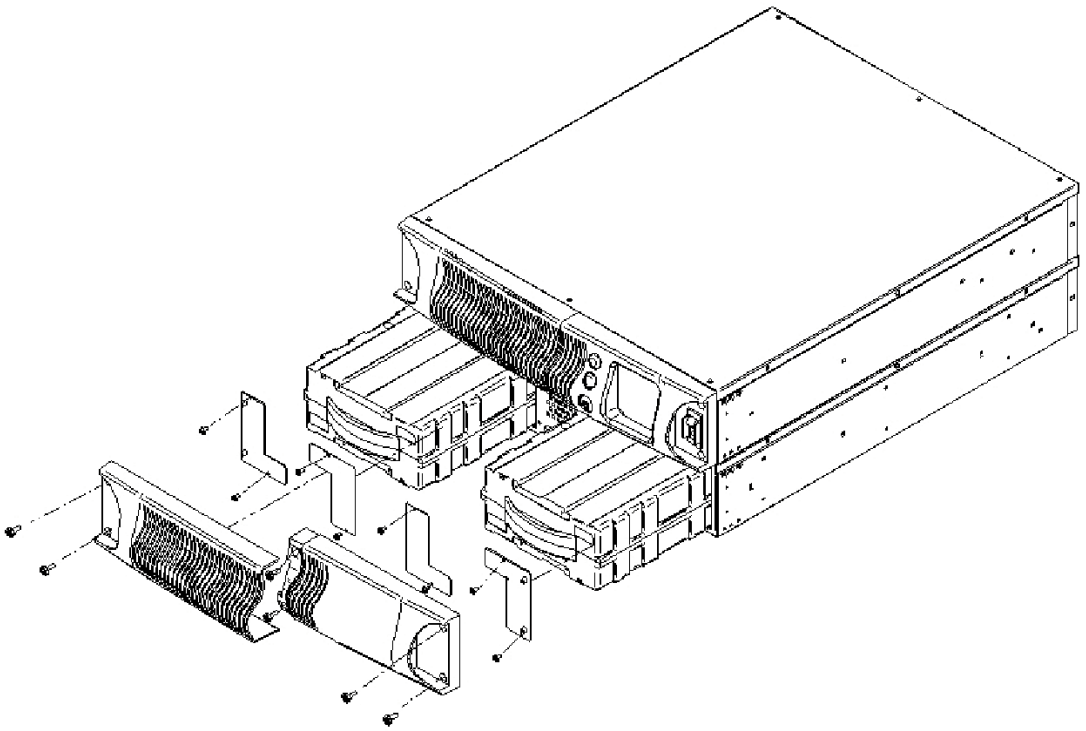
NEVER ATTEMPT TO DISCONNECT THE BATTERIES OR REMOVE THE BATTERY FUSE OR TURN OFF THE BATTERY DISCONNECT WHILE THE UPS IS IN BATTERY MODE.

SSG1.5KRM-X Internal Battery Pack Replacement



1. Loosen and remove the screws on the left hand front panel. Remove the panel from the unit.
2. Lay the panel aside for reassembly.
3. Loosen and remove the screws of battery stop plate. Lay them aside for reassembly.
4. Grasp the battery pack, and pull it out of the front of the unit. Mark the top of the pack.
5. Unpack the new battery pack. Take care not to destroy the packaging. Compare new and old battery packs and verify that they are the same type. If so, proceed with the next step, otherwise stop and contact Falcon Service.
6. Line up and slide in the new replacement battery pack in the correct orientation, by referring to the mark on the original battery pack.
7. Gently push the battery pack back into the cabinet. Ensure it is tightly seated into the unit.
8. Reinstall the battery stop plate with the screws originally removed.
9. Reinstall the front panel to the unit with the screws originally removed.

SSG2.2KRM-X, SSG3KRM-X Standard and SSGR, SSGR-1 Extended Battery Module



Replacements

1. To replace the battery packs inside an extended battery module, unplug the connected battery cable from UPS and battery module.
2. Loosen and remove the screws from the battery module front panels. Remove both front panels from the module as shown above.
3. Lay the panels and screws aside for reassembly.
4. Loosen and remove the screws of battery stop plates. Lay them aside for reassembly.
5. Grasp the battery pack(s), and pull them out of the front of each side of the module. Mark the top of each pack.
6. Unpack the new battery packs. Taking care not to destroy the packing. Compare new and old battery packs to verify that they are same type. If so, proceed with next the step, otherwise stop and contact Falcon Service.
7. Line up and slide in the new replacement battery packs with right polarity by verifying against the marked battery pack.
8. Reinstall the battery stop plates with the screws previously removed.
9. Reinstall the front panels to the unit with the screws previously removed.
10. Re-connect the cable to the battery connector of UPS to that of the module.

Performing a Manual Battery Test

Pressing the "Function/Test" button for three seconds while the UPS is operating in Normal Mode will initiate a manual battery test. If the UPS goes to Battery Mode and returns to Normal On-line Mode after 10 seconds, the batteries are good.

If a single, long audible tone is sounded and the unit does not switch to Battery Mode, this indicates that either the batteries are defective, installed incorrectly, the battery pack is not installed, the battery bank interconnect cable is not installed, or the battery fuse is missing or defective. If the problem cannot be resolved, contact Falcon Service.

Battery Module Installation:

1. Mount the battery module directly above or below the UPS or battery module in the equipment rack.
2. Verify the battery disconnect is in the off postion.
3. Remove the battery inteconnect connector cover plate located on the module rear panel.
4. Connect the battery cable to the newly installed battery module. Next, connect the other end of the cable to the UPS.
5. If the an extended module is being installed, verify all battery module battery disconnect switches are turned to the “off” position. Two battery interconnect connectors are provided on each battery module to allow for a daisy chain connection to all modules and the UPS.

Performing a Manual Battery Test:

Pressing the "Function/Test" button for three seconds while the UPS is operating in Normal Mode will initiate a manual battery test. If the UPS goes to Battery Mode and returns to Normal On-line Mode after 10 seconds, the batteries are good.

If a single, long audible tone is sounded and the unit does not switch to battery mode, this indicates that either the batteries are defective, installed incorrectly, the battery pack is not installed, the battery bank interconnect cable is not installed, or the battery doscpnnect(s) are not in the “on” position. If the problem cannot be resolved, contact Falcon Service.

Recycling the Used Battery Packs

NEVER discard the UPS, the UPS battery pack, or batteries in the trash. Contact your local recycling or hazardous waste center for information on proper disposal of the used battery pack and batteries. The entire spent battery packs may be returned to the Falcon Service Center at the end user's expense for recycling. Prior to returning the spent battery pack(s), please call the Falcon Service Center and obtain a Return Materials Authorization (RMA) number.

NEVER dispose of batteries in a fire, as batteries will explode.

NEVER dispose of used batteries or the UPS in the trash or a landfill as it is a violation of federal and state laws. The UPS and batteries must be recycled. For UPS and battery recycling information, please contact Falcon Service for the name and address of the nearest battery recycling facility.

NEVER open or mutilate the battery or batteries. Released electrolyte is harmful to the skin and eyes. It may be toxic. A battery can present a risk of electrical shock and burns due to high short circuit current.

CAUTION

Observe all warnings, cautions, and notes before replacing batteries. Batteries can present a risk of electrical shock and burns due to high short circuit current. The following precautions should be observed when working on batteries:

- **Remove watches, rings, and other metal objects.**
- **Use tools with insulated handles.**
- **Do not lay tools or metal parts on top of batteries.**
- **Do not attempt to alter any battery wiring or connectors. Attempting to alter wiring can cause injury.**
- **Do not dispose of batteries in a fire. The batteries may explode. Refer to your local codes for disposal requirements.**
- **Do not open or mutilate the battery packs or batteries. Released electrolyte is harmful to the skin and eyes. It may be toxic.**

9.0 TROUBLESHOOTING

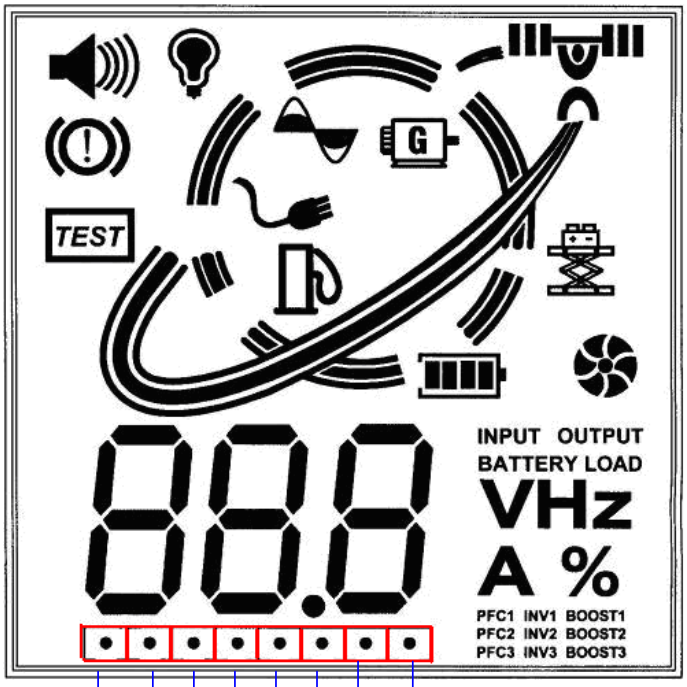
Audible Alarms

The SSG Series UPS features audible alarm codes to alert the user of potential problems. Please refer to the following table to identify and resolve alarms and the conditions causing the alarms.

Alarm and Possible Cause	*Solution*
Three short beeps, continuously • *Utility voltage out of range*	• *The UPS is in Battery Mode Check the input voltage*
Four short beeps, continuously • *Utility Frequency out of range*	• *The UPS is in Battery Mode, remove the input power and check the input frequency*
Five short beeps, continuously • *UPS internal over temperature* • *The Fan is not turning*	• *Check the ventilation and remove any blockage* • *Call Falcon Service for a fan replacement*
Six short beeps, continuously • *PFC over current protection in action*	• *Verify the input AC voltage is not too low, remove some load from UPS output*
Seven short beeps, followed by three long beeps, every five seconds • *Battery low after utility loss*	• *Save the data, turn off the equipment and wait for utility power to return*
One long beep every few seconds • *Output overload* • *Charger Fail* • *UPS Alarm, continuous*	*Check the LCD display* • *Remove some load* • *Call Falcon Service* • *Call Falcon Service*

UPS Alarm Status Display

Upon the UPS sounding a continious alarm condition, the alarm status bit will be displayed on the LCD display located on the UPS front panel. Please note the status bit number displayed and contact the Falcon service department immedately. To assist please inform them of the bit(s) displayed.



BIT 0 ;DC BUS voltage over high flag
BIT 1 ;soft start fault flag
BIT 2 ;inverter voltage over high flag
BIT 3 ;inverter voltage over low flag
BIT 4 ;output current over high flag
BIT 5 ;battery voltage over high flag
BIT 6 ;low DC bus voltage flag
BIT 7 ;inverter voltage feedback error flag

Warning: Upon experiancing errors Bit, 0, Bit 1, Bit, 2, Bit 3, Bit 6 and Bit 7 errors the UPS must be immediately turned off and the Falcon service department contacted. Attempting to turn the UPS back on may result in furter damage to its internal electronics.

Troubleshooting Guide

Prior to attempting any troubleshooting, always verify the UPS battery fuse is installed and the input voltage, input plug and wiring are correct. Please refer to the table below and attempt to solve the problem prior to contacting Falcon Service.

Problem and Possible Cause	*Solution*
UPS will not turn on • *Input breaker not switched ON* • *UPS input breaker tripped* • *Input/battery cables not correctly fitted*	• *Verify the UPS Input breaker on front panel is turned ON* • *Verify the connected load is less than the rating of the UPS* • *Verify the input cable and battery is connected to the UPS and battery module. Verify the battery circuit is turned ON*
UPS will not provide power to the load • *Power only present on one output receptacle* • *No output from any output receptacle* • *Output fails as soon as load is connected*	• *Check the output fuse* • *Check the connected cable* • *Ensure the load does not exceed the maximum rating of the UPS*
UPS operates from battery despite utility power presents • *Check fuse* • *Generator does not power UPS*	• *Input fuse may need replacing* • *Check generator is properly governed for both frequency and voltage. Some low grade generators will not supply a stable enough supply to run an UPS*
UPS drops the load and is in bypass mode with alarm	*Check the load status; the UPS may be overloaded*
UPS battery time is not long enough or the unit does not run on battery at all	*Test the battery by pressing "Function/Test" button. If the battery fails the test, replace the battery pack.*
UPS Beeping	*Refer to the audible alarms table*

Problem and Possible Cause	*Solution*
Button on front panel does not work • ***UPS in green mode*** • ***Key damaged***	• ***Wait for a while to operate*** • ***Call Falcon Service for a Returned Material Authorization (RMA)***

FCC Considerations

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

* Reorient or relocate the receiving antenna.
* Increase the separation between the equipment and receiver.
* Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
* Consult the dealer or an experienced radio/TV technician for help.

10.0 Technical Support

In the event your SSG Series UPS requires service or should any other technical support be required, write, call, fax or email Falcon Service.

Falcon Electric Inc.
5106 Azusa Canyon Road
Irwindale, CA. 91706
Service 800.842.6940
Voice 626.962.7770
Fax 626.962.7720
Email: service@falconups.com
WWW.FALCONUPS.COM

Please have your UPS model, serial number and date of purchase on hand prior to your call. This information is located on the identification label on the rear panel of the UPS. This information is essential in retrieving your unit's historical records. Should our service department determine service is required, you will be given a Return Material Authorization number (RMA) along with return shipping instructions.

The RMA number issued must appear on the outside of the shipping carton. The original shipping container must be used when returning any SSG Series product. **Failure to use the original shipping container and packing materials will likely result in the unit being received by Falcon with shipping damage.**

Falcon® Electric will not assume any responsibility for shipping damage. In the event shipping damage is found, you will be notified of the damage and be instructed to file a claim with the freight carrier. You will be billed for all required repairs due to the shipping damage. You must submit a copy of our repair invoice to the carrier for reimbursement.

All units must be returned prepaid. The address and shipping instructions will be given to you at the time the RMA is issued.

Requesting Technical Information or Support

You may request technical information or support by email or telephone.

Please send your technical or support questions by email to:

SUPPORT@FALCONUPS.COM

You may contact a FALCON support engineer directly by calling the FALCON support line between 9:00 am and 4:00 pm PST.

800.842.6940

FALCON Web Support

Product data sheets, specifications and owner's manuals are available in Adobe® Acrobat .PDF format on our corporate website at:

WWW.FALCONUPS.COM

FALCON ELECTRIC, INC.

NEW PRODUCT LIMITED WARRANTY

Limited Warranty: Falcon warrants that this product will be free from defects in materials and workmanship for a period of two years from the date of shipment by Falcon.

Procedures: Any defective product must be returned to Falcon. No product can be returned without first obtaining a Return Material Authorization (RMA) number from Falcon. Falcon will repair, replace or refund the purchaser price, at Falcon's sole discretion, for any defective product that is returned to Falcon with an RMA number. For defective product returned within 30 days of shipment, Falcon will pay for shipping costs to and from its service center. For defective product returned after 30 days but within 90 days of shipment, Falcon will only pay for shipping costs in sending the new or repaired product back to the end-user. For defective product returned more than 90 days after shipment, all shipping costs will be borne by the end-user.

Exclusions: This limited warranty does not cover damage caused by: (i) improper installation, misuse or neglect; (ii) unauthorized repairs or modifications or use of unauthorized parts; (iii) acts or events outside of Falcon's control, such as fire, accidents, impacts; (iv) normal wear and tear, such as cleaning and replacement of batteries. The warranty is null and void if: (i) the product is used in conjunction with life support equipment; (ii) the factory seal is broken or shows signs of tampering; or (iii) the battery is allowed to discharge below the minimum battery cutoff point. To prevent this discharge, remove the battery fuse, or switch the battery disconnect to the "off" position when the unit is to be stored without the AC power being supplied to the UPS for more than two days. The battery must be recharged every four to six months when not in use. This limited warranty is not transferable.

Limitations: IN NO EVENT IS FALCON RESPONSIBLE FOR ANY SPECIAL, INDIRECT, SECONDARY OR CONSEQUENTIAL DAMAGES, SUCH AS PERSONAL INJURY, DAMAGE TO PROPERTY, LOSS OF DATA, LOST PROFITS, ETC. IN NO EVENT WILL FALCON'S LIABILITY UNDER THIS LIMITED WARRANTY EXCEED THE PURCHASE PRICE PAID FOR THE PRODUCT IN QUESTION.

Disclaimers: The limited warranties set forth in this document are the only warranties that apply to Falcon's products. **ALL OTHER WARRANTIES ARE EXPRESSLY DISCLAIMED, INCLUDING ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS, AND YOU MAY HAVE OTHER LEGAL RIGHTS THAT VARY FROM STATE TO STATE.**

2007-04 Rev. C

SSG Series™ Industrial-Grade UPS PLUS® *1.5kVA - 3kVA*

Model Number	SSG1.5KRM-1 SSG1.5KRM-2	SSG2.2KRM-1 SSG2.2KRM-2	SSG3KRM-1 SSG3KRM-2
Nominal VA	1500	2200	3000
Electrical Input			
Nominal AC Voltage	-1 Models 120Vac -2 Models 208-240Vac		
AC Voltage Range	-1 Models 80-138Vac -2 Models 160-276Vac		
Frequency	50/60 Hz ± 5% (Auto Tracking)		
Power Factor Correction	> 0.97 (at full load)		
Surge Suppression	IEEE/ANSI C62.41		
Efficiency (Typ.)	> 87%		
Electrical Output			
Watts	1050	1540	2100
AC Voltage (User Programmable)	-1 Models = 100, 110, 115 or 120Vac (sinewave) -2 Models = 208, 220, 230 or 240Vac (sinewave)		
Frequency	50/60 Hz (Auto Tracking or user programmable fixed 50 or 60Hz modes)		
Frequency Stability	± 0.3% (Battery Mode), ±5% Synchronized to the input frequency in utility mode		
Voltage Regulation	± 2%		
Step Load Change	± 7% for 100% load variation, recovery in 5ms		
Harmonic Distortion	< 3% Linear Load, < 5% Non-Linear Load		
Overload	150% for 10 seconds, 110% for 20 seconds, 105% for 50 seconds		
Crest Ratio	3:1		
Battery			
DC Bus Voltage (nominal)	48Vdc	96Vdc	
Battery Pack Type	User-Replaceable, Hot-Swappable (Batteries are replaceable through the front panel) (Battery packs are replaceable through the front panel without removing the UPS, battery bank or EBM from the equipment rack)		
Battery Type (With standard VRLA Type) SSGLi-4 Ten-Year Lithium-Ion Battery Option	10-Year Rated, VRLA Batteries, 12Vdc, 7AH (4) 10-Year Rated, Lithium-Ion 12Vdc, 4.6AH	10-Year Rated, Maintenance-Free, Sealed VRLA Batteries, 12Vdc, 7AH N/A	
Back Up Time (With standard VRLA Type) SSGLi-4 Ten-Year Lithium-Ion Battery Option SSGLi-8 2U External Lithium-Ion Bank	5 minutes / 16 minutes 9.5 minutes / 20 minutes 28.5 minutes / 60 minutes	8 minutes / 20 minutes N/A N/A	6 minutes / 18 minutes N/A N/A
Recharge Time	8 Hours to 90%		
Transfer Time			
Line Fails/Recovers	Zero		
UPS to Bypass or Reverse	< 4ms		
After Overload	Auto Transfer to UPS		
With Frequency Converter Options	Bypass Disabled		
Electrical Connections			
Input	-1 Models = 6' Cord with 5-15P Plug -2 Models = 6' Cord with Schuko Plug	-1 Models = 6' Cord with 5-20P Plug -2 Models = 6' Cord with Schuko Plug	-1 Models = 6' Cord with L5-30P Plug -2 Models = 6' Cord with Schuko Plug
Output	(8) 5-15R (4) IEC320	(4) 5-15R & (1) L5-20R (4) IEC320	(4) 5-15R & (1) L5-30R (4) IEC320
Environmental			
Temperature Operational Storage	-20ºC - 55ºC (-4ºF to 131ºF) (Extended operation in temperatures above 25ºC will shorten the battery life) -15ºC - 50ºC (5ºF to 122ºF) (Extended storage in temperatures above 25ºC will shorten the battery life)		
Humidity	10% to 95% Non – Condensing		
Altitude	10,000 Feet (3000 meters) without derating		
Cooling	Low Velocity Forced Air Fans		
Heat Dissipation (BTU/Hour)	535	784	1071
Audible Noise (@ 1 Meter)	<50dBA		
Controls & Indicators			
LCD Display	MIMIC Graphical Display, Input/Output Voltage, Frequency & Load, Alarm, Programmable settings & UPS state icons		
Audible Alarms	DC Mode, Low Battery, Over/Under Voltage, Over/Under Frequency, High Temp., Over Load, Fault Alarm		
Load Segment Control	Two programmable load segments, one continuous load segment		
Remote Emergency Power Off (or) Remote Output Receptacle Control	(Standard) Meets NFPA 70, NEC 645-11 (REPO connections located on the UPS rear panel) (Optional) UPS Load Segment Controlled Output Receptacles can be turned off and on using a remote isolated switch contact.		
Communications	USB Port, RS-232C Serial Port, Optional SNMP/HTTP Agent Board (UPS Bundled UPSilon 2000 Software)		
Mechanical			
Dimensions inches (mm) H x W x D SSGH-B Battery Module	(2U) 3.5 x 19 x 21.3 (88 x 482.6 x 540) (None - Batteries inside UPS)	(2U) 3.5 x 19 x 21.3 (88 x 482.6 x 540) (2U) 3.5 x 19 x 21.3 (88 x 482.6 x 540)	
Weight lb. (kg) Ten-Year VRLA Batteries (Standard) SSGLi-4 Ten-Year Lithium-Ion Battery Option SSGLi-8 2U Lithium-Ion Extended Bank	UPS With Internal VRLA batteries = 55 (24.5) With Internal Lithium batteries = 39.5 (17.9) External 2U Lithium Battery Bank = 39.15	(2U) UPS Module = 32 (14.5) (2U) External Battery Module = 70.6 (32) N/A N/A	(2U) UPS Module = 32 (14.5) (2U) External Battery Module = 70.6 (32) N/A N/A
Agency Approvals	-1 Models = UL 1778, CUL, FCC Class B, -2 Models = CE, UL 1778, CUL		

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Falcon Electric, Inc. - 5106 Azusa Canyon Rd. - Irwindale, CA 91706 - 800.842.6940 Fax 626.962.7720

www.falconups.com - email: sales@falconups.com

SSG-HW Series™ Industrial-Grade UPS PLUS® *2.2kVA - 3kVA*

Model Number	SSG2.2RM-1-HW SSG2.2RM-2-HW	SSG3KRM-1-HW SSG3KRM-2-HW
Nominal VA	2200	3000
Electrical Input		
Nominal AC Voltage	-1 Models =120Vac -2 Models = 208-240Vac	
AC Voltage Range	-1 Models = 80-138Vac -2 Models = 160-276Vac	
Frequency	50/60 Hz ± 5% (Auto Tracking)	
Power Factor Correction	> 0.97	
Surge Suppression	IEEE/ANSI C62.41	
Efficiency (Typical)	> 87%	
Electrical Output		
Watts	1540	2100
AC Voltage (User Programmable)	-1 Models = 100, 110, 115 or 120Vac (sinewave) -2 Models = 208, 220, 230, 240Vac (Sinewave)	
Frequency	50/60 Hz (Auto Tracking or user programmable fixed 50 or 60Hz modes)	
Frequency Stability	± 0.3% (Battery Mode), ±5% Synchronized to the input frequency in utility mode	
Voltage Regulation	Voltage Regulation	
Step Load Change	± 7% for 100% load variation, recovery in 5ms	
Harmonic Distortion	< 3% Linear Load, < 5% Non-Linear Load	
Overload	150% for 10 seconds, 110% for 20 seconds, 105% for 50 seconds	
Crest Ratio	3:1	
Battery		
DC Bus Voltage	96Vdc	
Back Up Time @Full Load @1/2 Load	8 minutes 20 minutes	6 minutes 18 minutes
Battery Pack Type	User-Replaceable, Hot-Swappable individual 48Vdc packs Battery packs are replaceable through the front panel without removing the UPS, battery bank or EBM from the rack Long-life, 8 to 10 Year, Maintenance-Free, Sealed VRLA Batteries, 12Vdc, 7AH	
Number of Battery Packs (48Vdc)	(2)	
Recharge Time	8 Hours to 90%	
Transfer Time		
Line Fails/Recovers	Zero	
UPS to Bypass or Reverse	< 4ms	
After Overload	Auto Transfer to UPS	
With Frequency Converter Options	Bypass Disabled	
Electrical Connections		
Input	-1 Models = 6' line cord with 5-20P -2 Models = 6' line cord with Schuko The plug may be removed and cord used to hardwire	-1 Models = 6' line cord with L5-30P -2 Models = 6' line cord with Schuko The plug may be removed and cord used to hardwire
Output	Hardwire Terminal Block	
Environmental		
Temperature Operational Storage	-20ºC to +40º C (-4ºF to 104ºF) -15ºC to +50ºC (5ºF to 122ºF)	
Humidity	10% to 95% Non – Condensing	
Altitude	10,000 Feet (3000 meters) without derating	
Cooling	Low Velocity Forced Air Fans	
Heat Dissipation (BTU/Hour)	784	1071
Audible Noise @ 1 Meter	<50dBA	
Controls & Indicators		
LCD Display	MIMIC Graphical Display, Input/Output Voltage, Frequency & Load, Alarm, Programmable settings & UPS state icons	
Audible Alarms	DC Mode, Low Battery, Over/Under Voltage, Over/Under Frequency, High Temp., Over Load, Fault Alarm	
Load Segment Control	Two programmable load segments, one continuous load segment	
Remote Emergency Power Off (or) Remote Output Receptacle Control	(Standard) Meets NFPA 70, NEC 645-11 (REPO connections located on the UPS rear panel) (Optional) UPS Load Segment Controlled Output Receptacles can be turned off and on using a remote isolated switch contact.	
Communications	USB Port, RS-232C Serial Port, Optional SNMP/HTTP Agent Board (UPS Bundled UPSilon Software)	
Mechanical		
Dimensions UPS inches (mm) H x W x D	(2U) 3.5 x 16.8 x 21.3 (88.5 x 426 x 540)	
Standard Battery Module	(2U) 3.5 x 16.8 x 21.3 (88.5 x 426 x 540)	
	(2U) 3.5 x 16.8 x 21.3 (88.5 x 426 x 540)	
Weight lb. (kg) UPS Battery Bank	32 (14.5) 70.6 (32.1)	
Agency Listing	-1 Models UL 1778, CUL, FCC Class B, -2 Models CE,UL 1778, CUL	

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